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Employers' Compensation.

[Prepared by MR. O. O. THWING, for Sixth Meeting, Indiana Gas Association.]

The compensation of an employer frequently consists in the satisfaction he receives at being referred to, as such, by the press and public. When he is done with pay rolls, workmen's compensation, taxes of ingenious varieties, permits, licenses, penalties, subscriptions, donations, fluctuations in the market, insurance, errors, competition, bad debts, business depression and a few more incidental drawbacks, there is often not much left except his hope of immortality and a better world, his standing in the community as an employer of men and his vivid recollections of the days when he walked up to the counter and drew his envelope without worrying as to where the contents came from.

I have a friend who owns a small business that he has built up in 30 years since he ceased to be an employee and decided to become an employer. He has probably $30,000 invested in his plant, and last year did $31,000 of business, paying out of that sum, $18,000 to his employes. After deducting all other expenses pertaining to the business, he had left $3,000 net earnings, or 10 per cent. on his investment of $30,000, without taking into consideration his own efforts, since he draws no salary from the business. He had paid to his employes a sum equal to the interest on $180,000 at 10 per cent. during the year, showing that his employes were capitalized for 6 times his investment on an equal earning basis.

The latest available reports of 87 railroads of the country show that 17 of them, or 19½ per cent., closed their year's business with a deficit in their earnings, while 9 show a surplus of less than $100,000 each. These railroads maintain over 1,500,000 employes with a daily compensation of ever $3,500,000. They are subject to every possible device for decreasing their compensation as employers, in fact, their compensation is rapidly becoming a visionary thing, yet their recent request for the privilege of advancing rates 5 per cent. has been tabled for future consideration, and they are powerless to prevent additional loss during that period. In the meantime the pay roll must be met and the only recourse left is to reduce the pay roll as far as possible. The result can be seen in the recent newspaper reports and the candidates for "Unemployment Compensation" are receiving fresh accretions daily. Verily, if the "Workman is worthy of his hire," the one who hires him is worthy of consideration, even to the extent of receiving reasonable returns on money invested.

During the 12 months, from November 1, 1912, to October 31, 1913, there were, business failures of manufacturers, 4,123, with liabilities of $113,229,000 and, of traders, 10,891, with liabilities of $108,131,000 or a total among employers of 15,632, with total liabilities of $252,802,000. Assuming that most of the failures reported were companies or partnerships, probably 50,000 persons, who had the nerve to become employers, lost not only all compensation but their investments as well.

I have cited the above cases, not for the purpose of sounding the horn of calamity, but to show that the employer does not always sit in a bower of roses, counting his profits to the sound of beautiful music.

In the industrial battles that are constantly waged, the Red Cross corps of politics and public opinion are devoting their energies to the relief of the employee, while the employer is not only left to shift for himself, but is subjected frequently to a kick or a cuff on the part of those who should be first aid to the injured. Workmen's compensation is an established fact at present in all manufacturing countries, differing only in extent and scope, but there can be no question that not many years will elapse until such compensation will include accidents, injury, sickness, unemployment, disability and old age.

The world is filled with things of value, yet that which has made or can make them valuable is human effort only. The mines must be dug—the crops must be planted and gathered—land and sea must be traversed before value can accrue to the products of the earth. Individual human effort adds but little of value, since it can accomplish only in a small way. The great values and the great benefits to humanity have been created by combined, protracted, cumulative, directed human effort. The power to direct such combined efforts requires resources at the command of the director to properly reward those who are so combined, to support them while they are producing that which is neither food nor shelter (the primitive necessities), and to carry an undertaking to final completion. This constitutes employment.

The employer is the resultant of capital plus imagination. If a man have capital, but not imagination, he will never become an employer, but will be only a miser. If he have imagination without

capital, he can become an employer only by forming a partnership with capital. In any case, capital is the essential factor in employment for, let the equipment of factory or store be unexcelled, the mine be ever so rich, the transportation facilities perfect, unless the pay roll be ready at the appointed time, employment ceases automatically. The assurance of practically immediate compensation for services constitutes the economic difference between employee and and employer.

Capital enters the field of employment for gain. If there be no gain, capital withdraws and employment ceases. Since the employment of its people is the greatest achievement of the State, why should it, by enactment, discourage capital, from creating employment, by imposing constantly accumulating burdens, and restricting reasonable profits?

The employer is distinctly a public benefactor in that he not only furnishes means of livelihood by employment, but must provide against injury and accidental death to those employed by him, and, in the final fulfilment of the objects of social insurance, must assist in provisions for the maintenance of the employes of the nation. In addition, he sustains the government by taxes, permits, licenses, fees, etc., many of which are peculiar to him as an employer only.

A reasonable restriction of great profits in business cannot be criticised, but the great profits have been made, not by the employers of labor, but by the manipulators of values. For this reason, there is a legislative tendency to confuse honest investment with manipulation, with the result that the earning power of public utilities has been restricted to a bank interest compensation, based upon physical valuation only. When one considers that the exploitation and launching of any enterprise represents, at least, 25 per cent. more than the tangible assets, covering expense of organization, engineering, financing, operation for 1 to 3 years at a loss, interest on investment during construction and operation without profit, preliminary advertising and solicitation, etc., such basis for earnings does not seem fair.

In such cases where the earnings of employers are restricted by the State, the fact that, as an employer, the enterprise is of distinct benefit to the commonwealth, should be given cognizance and earnings should be allowed, in addition to those on the investment, based upon the compensation in wage, salaries and otherwise, that is paid to employees.

In conclusion, I wish to say, as I said a year ago, I am heartily in favor of workmen's compensation, to the limit of social insurance, including accidents, sickness, disability, unemployment and old age. But I believe that the burden should be borne by society instead of by the employer. There seems no probability, at present, that the employer can escape this burden. Such being the case, let us hope that the employer will receive due consideration from the workmen, the public, the press and the State. This would help to make "Employer's Compensation."

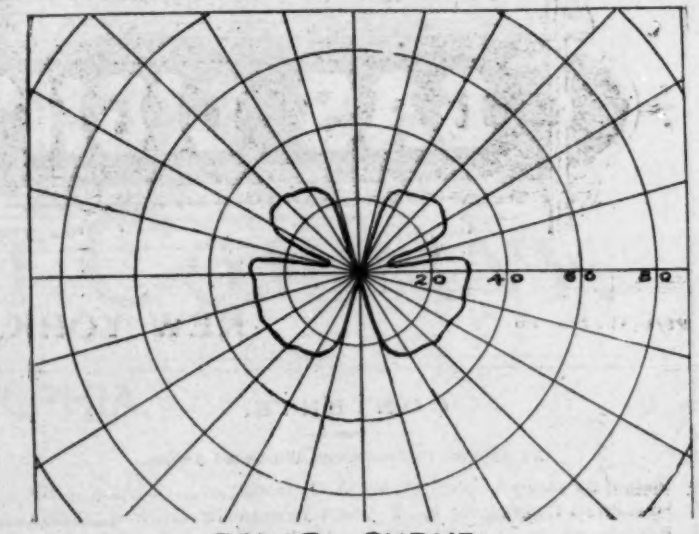
Gas Street Lighting.[1]

[Prepared by Mr. F. Victor Westermaier, for Tenth Meeting, Illinois Gas Association.]

Street lighting, while not entirely neglected, is seldom seriously considered by American gas companies as a factor in the general development of their business, while abroad it is recognized as an important field for their output, both as a considerable consumer and as the best means of advertising gas for illumination.

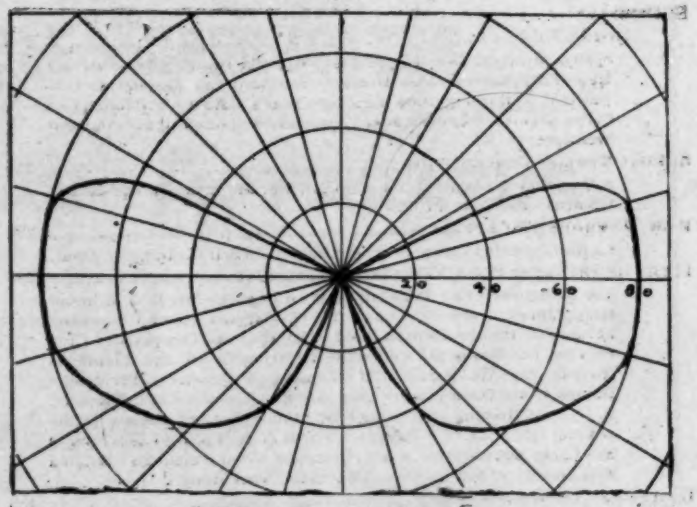
At the time of the introduction of the incandescent gas mantle, electric arcs and incandescents were sweeping the flat flame gas lamps off the street at an alarming rate, because the industrial and social growth of cities demanded brighter street lighting. Municipalities, having experienced the improvement in street lighting with electric lamps, were slow in appreciating the advantages of incandescent gas lighting, and it was necessary to convince the public, by demonstration, that it was modern. When it was found that this form of lighting was better than the electric incandescent lighting they were willing to accept gas again, and from then on it has continued in public favor. At present there are more mantle street lamps in service than there ever were of the flat flame type, when gas monopolized street lighting.

The change from flat flame to incandescent units required special equipment to make the latter practical and to facilitate efficient maintenance. Not only was an improvement made in appearance, but with the new lamp decidedly better distribution of light was obtained (see Figs. 1 and 2), in the flat flame square lamps the flux of



POLAR CURVE
OF
FLAT FLAME GAS LAMP
CONSUMPTION CU FT PER HR = 6.48
MEAN UPPER HEMISPHERICAL CP 20.6
" LOWER " " 26.9
" SPHERICAL " 23.7
PRESSURE 3.0"

Fig. 1.



POLAR CURVE
OF INCANDESCENT MANTLE LAMP
BOULEVARD TYPE
CONSUMPTION CU FT PER HR = 3.43
MEAN UPPER HEMISPHERICAL C P 34.8
" LOWER " " 63.9
" SPHERICAL " 49.4
PRESSURE 2.0"

Fig. 2.

light above the horizontal being almost equal to that below the horizontal, whereas the lower distribution of the mantle lamp is almost twice its upper. The incandescent lamp consumes 3.43 cubic feet of gas per hour, instead of 6.48, and produces 63.9 mean lower hemispherical candles against 26.9 candles by the flat flame lamp. In other words, with 53 per cent. of the gas, 2.4 times the useful light is produced, a net gain of 349 per cent. It was this which saved gas as a street illuminant.

Proper spacing of lamps is necessary to obtain the best street lighting results, and in this, American practice is inferior to the European. In our cities the average longitudinal spacing of lamps along the street ranges from 100 to 200 feet, whereas 100 feet measured diagonally, lamp to-lamp, is the maximum in Europe, the average there being 65 feet, and where more light is wanted each lamp contains 2 mantles.

The low intrinsic brilliancy of the upright mantle makes it possible to place lamps within the field of vision without seriously impairing visual acuity; and reflectors have not been adopted in the present gas street lamps because the advantage of redirecting the

1. Slightly abridged.—Eds.

light emitted above the horizontal could only be gained by greater mounting height. It must also be remembered that illumination of the street surface is not the only important point in street lighting; the illumination on vertical surfaces is equally important in order that objects can be readily seen, and this is obtained, to a marked degree, with the present standard lamps.

The lamp shown in Fig. 3 is the recognized stand ard far gas street

Fig. 3.—Incandescent Mantle Gas Lamp.

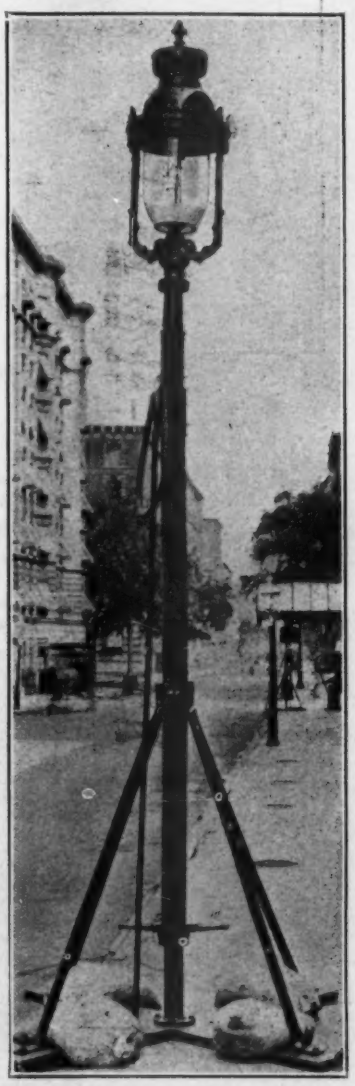


Fig. 4.—Test Unit—Single Upright Mantle.

lighting, and, with the 360 to 480 Watt open, and enclosed carbon and magnetic electric arcs, shares the street lighting field.

Although there are hundreds of automatic devices on the market, lighting and extinguishing are still generally done by patrol. The chief claim made for any automatic lighter is that the cost of operation is reduced by eliminating the night and morning patrols, which claim is not always a valid one when the importance of the service is taken into consideration. One of the reasons why gas street lighting has progressed, in spite of prejudice and competition, is the character of its service. Contracts are made by guaranteeing service, and anything that might improve the service should be adopted, and it must not be cheapened by anything which reduces operating cost, if that might lower the maintenance standard.

Lamps must be lighted and extinguished on schedule time, cleaned at regular intervals, trimmed and maintained always in a condition of standard efficiency. To meet these requirements, the method of operation must be as infallible as human ingenuity can make it.

Street lighting by units of higher candle power than the standard lamp described, has not been extended here as it has abroad, because of the lack of encouragement on the part of gas companies and the municipalities. If gas is to continue as a competitor of electricity for street lighting, gas rates will have to be made to conform with electric rates for the same purpose, in order that the increased efficiencies by larger gas consumptions can be obtained.

To demonstrate what could be done with lamps of higher candle power, a series of tests was made on a street representative of average gas street lighting, to demonstrate the possibilities of gas street lighting at moderately increased rates of gas consumption. In making these tests, special portable lamps were designed, capable of using upright and inverted mantles, singly and in clusters, and with portable posts, adjustable as to height. They were spaced along the street, opposite the lamps in service. The gas was supplied through a 2 inch wrought iron pipe laid along the curb, and connected with the underground main through a meter. The street was 800 feet long, 30 feet curb-to-curb, and lighted by 8 standard lamps. Horizontal illumination measurements were made at equally spaced test stations along the center of the street, at an elevation of 3 feet. Then test lamps were set up and the mounting height of the lamps raised until the measurements indicated a fair degree of uniformity. The illumination measurements were taken then, and the values of the test units compared with those obtained with the regular lamps.

It was found that the most uniform lighting results were obtained with the upright mantle units, although by using special frosted glass excellent diffusive effects were produced with the inverted mantle units. With clear glass globes, the inverted lamps gave a spotted effect, their maximum flux of light tending more toward the vertical. Fig. 5 shows an upright mantle fixture in the test lamp, with regular lamps in the background. The lamp at 13 feet 2 inches above the street, gave excellent results on a consumption of 5 cubic feet per hour. When at the regular height (9 feet 6 inches) the intensity of light about the post was increased, but the minimum value between lamps was not materially greater, showing the effect of elevation. The ratio of maximum to minimum illumination, along the center of the street, with this lamp was 2.21, as compared with 2.99 with the regular lamps. The minimum illumination was raised from .0128 to 0.0323 feet candles, a gain of 152 per cent., and an increased general average illumination of 107 per cent., by an increased gas consumption of only 42.8 per cent.

Two upright mantles in this unit, at a height of 13 feet 8 inches, raised the minimum illumination by 274.2 per cent. and the general average illumination by 295.5 per cent. with an increase of 100 per cent. in gas consumption.

Several single and multiple inverted mantle outfits were tried with satisfactory results, the best, shown in Fig. 5, having 4 inverted

Fig. 5.—Test Unit—Four Invert d Mantles, Clear Glass Globes.

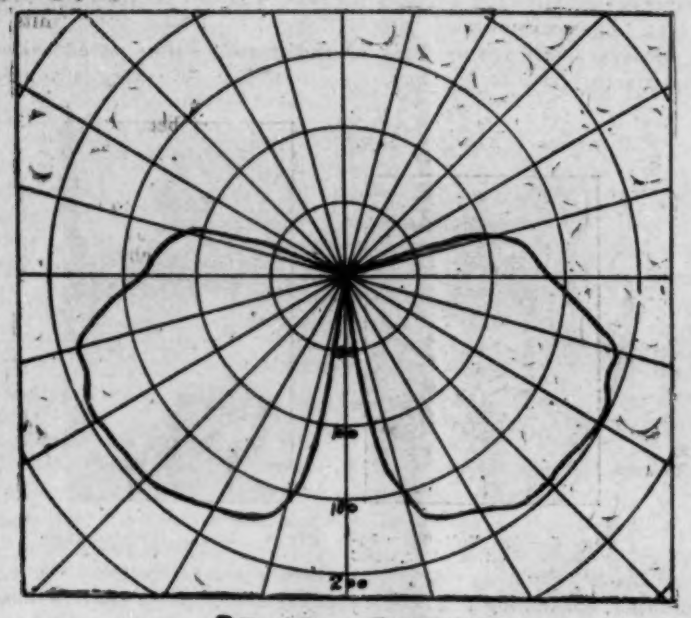
Fig. 6.—Double Inverted Mantle Unit, Clear Glass Globe.

mantles, consuming 11.50 cubic foot per hour. With the lower part of the globe frosted much of the downward flux of light was diffused, assisting the general effect and eliminating bright spots around the post. Even better results were had with the globe of crystal glass over which was flashed a light film of alabaster and frosted on the outside up to within 7½ inches of the top. The absorption of light by this globe was 18 per cent. greater than with the plain glass globe, but more than compensated for this loss, by breaking up the glaring effect of the clear glass, increasing the diffusion of light over the globe surface, and eliminating specular reflection. In comparison with the regular lamp this unit, with clouded alabaster globes, mounted 15 feet 2 inches above the street, raised the minimum illumination 694.5 per cent., and the general average illumination 559 per cent.; the ratio of maximum to minimum illumination values being 2.63, as compared with 2.99 with the regular lamps, produced by an increased consumption of 8 cubic feet per hour, or about 288 per cent. A decided ornamental effect was produced with this unit by using a totally diffusing globe of polycase glass. Although the general average illumination was not as high as with the clouded

globes, the uniformity of illumination was well maintained. Th density of this glass was great enough to obscure the light source, the entire globe being illuminated. For exclusive and restricted section lighting, no more beautiful unit than this could be used.

These tests demonstrated that, with increased gas consumption, marked advantages in lighting effects could be produced, not only in increased illumination, but in raising the dignity of gas as a street illuminant, but posts of proper height and of an appropriate design are necessary. This expense the city was not in a position to bear, consequently the improved lighting demonstrated could not be procured. Had the posts been supplied, as is done by the Electric Light Company when new units are installed, it is probable that increased lighting business would have been obtained. Interest was aroused, however, by these demonstrations, to the extent of calling for further tests to determine what results could be obtained with the existing posts and increased gas consumption. The fixture finally considered the most practical consisted of two inverted mantles mounted high in the regular lamp and directly beneath a flat enamel reflector. (Fig. 6). With an increase of 2 cubic feet of gas per hour per post, the minimum and average illumination values were raised 258 and 282 per cent., respectively; the ratio of maximum to minimum illumination values being 3.49, as compared with 2.99 with the regular lamps; not quite as uniform in illuminating effect, but nevertheless satisfactory, considering the fixed mounting height.

The intrinsic brilliancy of this unit. in a clear glass globe, was somewhat higher than that of the upright mantle, making the effect of glare more noticeable. To overcome this the clear glass globe was flashed with a light coating of alabaster, the frosting carried up to a point which would reduce the high illumination directly around the post and project the maximum rays the greatest distance. The disturbing element of glare very much reduced, and a generally better lighting effect was obtained by reason of the change in distribution, as shown in the polar curves, Figs. 7 and 8. It is seen that the latter curve approaches very closely ideal distribution for street lighting purposes.

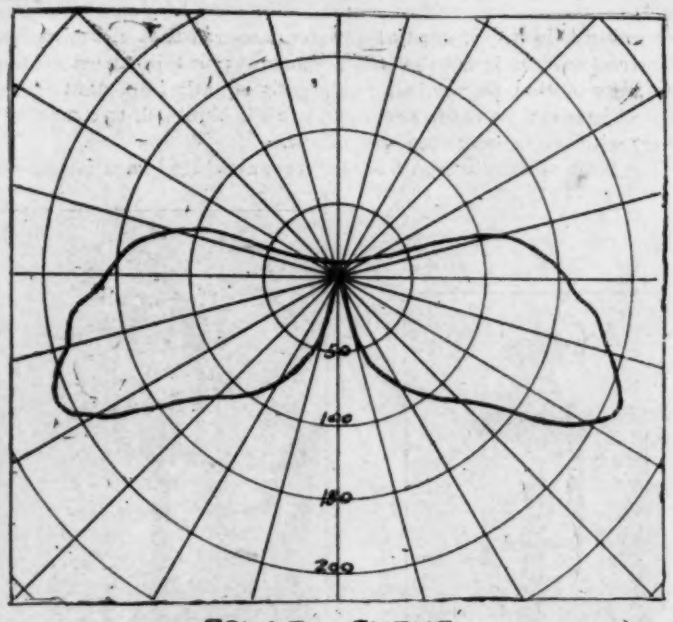


POLAR CURVE
OF
DOUBLE INVERTED UNITS
CLEAR GLASS GLOBE
CONSUMPTION CU.FT PER HR. = 5.81
MEAN LOWER HEMISPHERICAL C.P. 181.8
MAXIMUM AT 65° TO 40° " 185.0

Fig. 7.

These units, mounted on the same posts as the regular lamps, hold substantially the same degree of uniformity of illumination, but increases the minimum illumination value 235 per cent., and the average 266 per cent., with increased gas consumption of 57 per cent.; with posts a few feet higher better results would have been obtained.

Fig. 9 shows graphically the differences between the two units. In the many plans for beautifying cities, the more ornamental street units are receiving consideration, and special lamps and posts have been designed where necessary appropriations were available. In addition to attractive appearance the principal requirement is that



POLAR CURVE
OF
DOUBLE INVERTED UNITS
FLASHED ALABASTER FROSTED GLOBE
CONSUMPTION CU.FT PER HR. = 5.81
MEAN LOWER HEMISPHERICAL C.P. 151.0
MAXIMUM AT 65° " 210.0

Fig. 8.

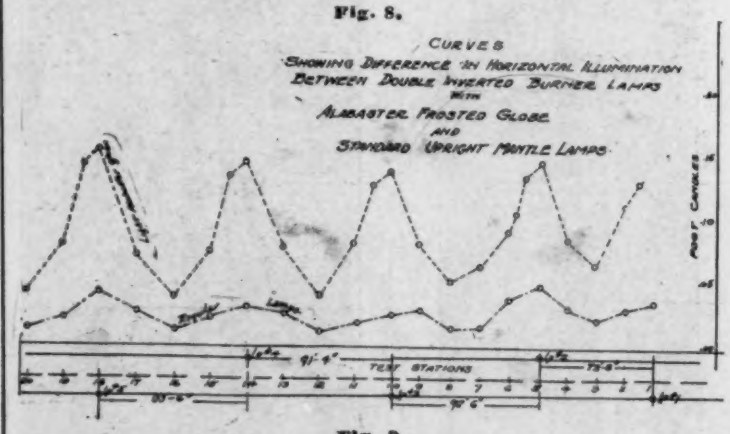


Fig. 9.

the light source be invisible, thereby necessitating the use of total diffusing globes. Under such requirements, gas units, by reason of their lower intrinsic brilliancy, have an advantage over electric units in that glass of lesser density can be used. Fig. 10 shows regular lamp posts equipped with ornamental heads; the globes 13 inches in diameter, of Polycase and Melilite glass, inclosing double inverted mantle units consuming 5½ cubic feet of gas per hour. These lamps are attractive in appearance, and give a beautiful, soft lighting effect. However, as more light must be absorbed, closer spacing is required for ornamental lighting units than with regular street lamps.

Another type of ornamental lamp head, Fig. 11, has spherical and elongated Alba glass globes enclosing single upright mantles, burning 3.5 cubic feet per hour; these lamps, closer spaced, produce excellent results. Other installations of ornamental standards are shown in Figs. 12, 13, 14 and 15. Cluster units are employed where a maximum degree of illumination is desired, as at street intersections, single units, evenly and closely spaced along the street between blocks.

The advantages of high pressure gas lighting are so evident where high candle power and greater efficiency are required, that numerous cities abroad have adopted it as the principal street illuminant. With units of 1,000 to 4,500 candle power, operating at efficiencies of 45 to 60 candles per cubic foot, not only is the standard of street lighting raised, but gas is given a position as the highest powered illuminant. Notwithstanding the large investment required for special mains, compressor plants, new lamps and posts, Berlin, London and Paris are continually extending high pressure gas street lighting, solely on merit, and in sharp competition with modern electric units.

In Berlin one finds the greatest systematic municipal developments along modern lines, therefore its adoption of high pressure gas street

Fig. 10.—Ornamental Gas Lamps, Portland, Me.

Fig. 11.—Ornamental Gas Lamps, Chicago, Ills.

Fig. 14.—Ornamental Gas Arc Lamps, Latham Park.

Fig. 15.—Ornamental Gas Lamp, Rydal, Pa.

Fig. 12.—Ornamental Gas Units, New Bedford, Mass.

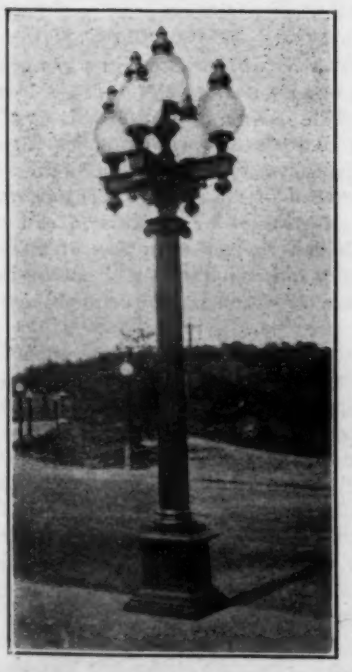


Fig. 13.—Ornamental Gas Units, Schenley Park, Pittsburgh, Pa.

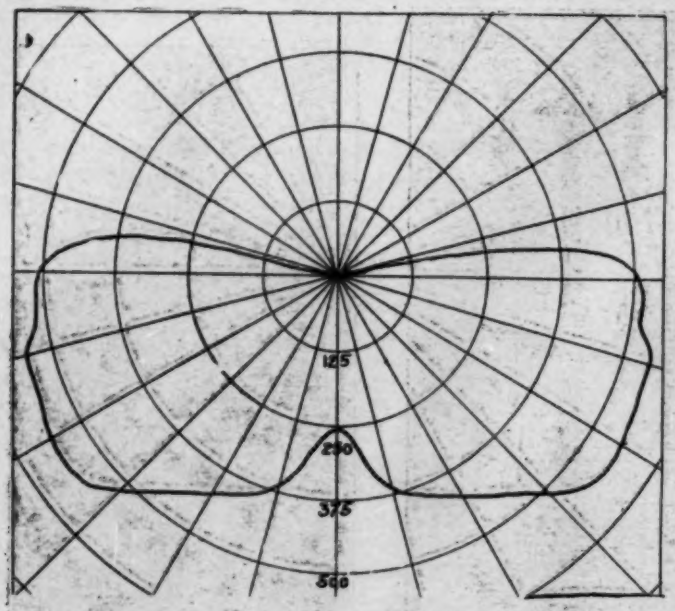
lighting on 60 miles of principal streets, should serve as a stimulus to the gas lighting industry. While the city owns the principal gas plants within its limits, it also has control of the electric light plants, in that it will acquire them in the near future. Not until extensive, careful experiments had been carried out, was gas finally adopted. The influence of Berlin has spread to other Capitols. Westminister, a part of greater London, has adopted high and low pressure gas units for its street lighting, after the keenest competition with electric companies.

The increasing use of high pressure gas lighting in the industrial and commercial fields abroad is indicative of the effect that successful street lighting has on the individual consumer.

In view of the growth of high pressure distribution systems in America, it is remarkable that the advantages of high pressure lighting have not been properly recognized. The installations made so far are mostly of an ornamental nature, for lighting the exteriors of gas office buildings. There are, however, two street lighting installations in operation long enough to demonstrate the practical advantages of large units where high pressure gas is available. One at Atlantic Highlands, N. J., where fourteen 500-candle power units, of the type shown in Fig. 16, were installed early in 1913. After a year's operation the service is so satisfactory that the number of lamps has been doubled with the prospect of high pressure lighting throughout that entire district. The other installation is at Waterbury, Conn., lighting the approaches to the railway station with seven 500-candle power lamps. These units have given very satisfactory service for over 3 years, and had it been practical to extend high pressure mains to other parts of the city, additional gas street lighting could have been obtained. The polar curve, Fig. 17, of the lamps used at Waterbury and Atlantic Highlands shows that the distribution of light in the vertical plain from an inverted mantle is much better with high pressure than with low pressure gas.

Fig. 16.—High Pressure 500-Candle Power Lamp on Lines of Atlantic Highlands Gas Company, Oceanic, N. J.

Probably the finest example of street lighting in the United States was shown in Philadelphia during the Convention of the National Commercial Gas Association, December, 1913. Thirty-six lamps of the type shown in Fig. 18, were mounted on both sides of Broad street, between Walnut and Spruce, high pressure gas being supplied through a 3 inch temporary main with a booster plant in the Convention Hall. Each lamp had a mercury seal distance lighter in the base of the post, which opened the gas valves to the burners when the pressure was raised to 3 pounds per square inch; closing them, and opening the pilot when the pressure was reduced to normal. The burners were mounted within spherical globes of Melilite glass, 18 inches in diameter, resting in ornamental bowls and capped with bronze ventilators. Two mantles in each lamp produced, with a clear globe, a mean



POLAR CURVE
OF
500 CANDLE POWER
HIGH PRESSURE LAMP
CONSUMPTION (CORRECTED TO NORMAL) 11·12 CU FT PER HR
MEAN LOWER HEMISPHERICAL C P 512·3
MAXIMUM C P 563·0
PRESSURE 2 LBS PER SQ INCH

Fig. 17.

Fig. 18.—High Pressure Gas Ornamental Units, Philadelphia, Pa.

lower hemispherical candle power of 812 and at 10° below the horizontal, a maximum of 1,000-candle power, at a gas consumption of 21.3 cubic feet per hour.

The Melilite globe used reduced the light intensity to a maximum of 575-candle power at 25° below the horizontal, and the mean lower hemispherical to 508 candles. This intensity distributed over 1,000 square inches of globe surface gave results beautiful and practical, demonstrated by the high degree of illumination uniformly distributed over the broad surface of the street and the sides of buildings. The general effect produced was one of bright lighting, in which the light units themselves were conspicuous, only in that they were unobtrusive.

Electric companies have been more aggressive in acquiring street lighting business than gas companies, in that they demonstrate their willingness to serve by making concessions in the important element of price, and in supplying new units as they are developed, as well as the standards to go with them. The charge for current is always less than the domestic rate, and usually less than to the largest individual consumers. 480-watt arc lamps, consuming on 4,000-hour lighting schedule, 1,920-kw. hours per year, are contracted for at rates ranging from $60 to $90 per year, a rate for current, including installation and maintenance of lamps, of 3.125 cents and 4.687 cents per kw. hour; while the regular domestic rate in the same cities may be 10 cents to 15 cents. Gas for street lighting is seldom sold for less than the rate charged the smallest individual consumer. For a unit burning 25 cubic feet of gas per hour, competing with electric arcs in candle power delivered, the yearly consumption would be 100,000 cubic feet, which, at 80 cents per 1,000, almost equals the maximum price quoted for electric arc lamp service. To the cost of gas for this unit must be added installation and the maintenance charges, and under present fixed rates for gas for street lighting, gas units cannot meet the competition of electric units having a favorable rate for current.

The tendency of gas companies to regard street lighting solely as a commercial proposition, and a field for the profitable sale of gas, is, in no small measure, accountable for these conditions. That street lighting gives the advantage of the most public advertisement of its merits, is evidenced by the low rates made abroad to secure this important business. The volume of gas consumed in street lighting, although considerable, is but a small percentage of the entire output. Abroad it ranges from 4 to 8 per cent., while in this country it is generally less than 2 per cent. Considering the important bearing that this small proportion of the output has on the use of the product for general lighting purposes, some adjustment of the rate charged must be made to induce the extension of gas street lighting.

Given the encouragement it deserves, gas street lighting may rise to a prominence in this country, equal to that it has abroad.

[Official Report.—Continued from Page 268.]

FORTY-FOURTH MEETING, NEW ENGLAND ASSOCIATION OF GAS ENGINEERS.

Second Day.—Morning Session.

The President introduced Mr. G. A. Smith, of the Old Colony (Mass.) Gas Company, who read the following notes on

SOME EXPERIENCE IN AUTOMOBILE OPERATION.

The advent of the automobile widened the field for the high pressure gas system, covering a number of scattered small towns. Many of such companies, now successfully operating in surburban districts, would not be able to exist if forced to resort to horse service with its low radius of operation and high cost per mile.

There have of late been published so many reviews of automobile operation, giving details of construction of the various makes, with their cost of operation, that it has been thought best to confine this paper mainly to the experience of the author's Company and that of some other New England companies.

Motor delivery has solved many a vexing problem in a gas company's transportation service. Summer's heat and winter's cold do not interfere with its operation; it is alwrys "on the job" at any hour day or night, 24 hours a day, if necessary, without need of rest or time out for meals. Its large radius of operation permits the use of one central base of operation, instead of many small centers, and only requires a small storage space instead of large stables, feed lofts and wagon sheds. One automobile can replace a number of teams, and, when it is not running, is not "eating its head off," as are the horses. It delivers an emergency service which cannot be approached by the horse.

New England, with its excellent roads, offers unexcelled opportunity for the use of automobile transportation, and it is but a matter of a short time when most of the gas companies will find it necessary to adopt motor delivery. From observations of a great many cost records, and other operating statistics, the writer is of the belief that the gasoline motor will be generally used by the surburban companies with scattered territory, while the electric will be adopted in larger and more thickly settled cities. The gasoline car has a much larger radius of operation and can better cover a scattered territory, while the electric, although of much more limited radius, is more efficient for frequent stops and short runs.

The "fleet" of the Old Colony Gas Company consists of a 3 ton truck, a 2-ton truck, 2 half-ton trucks, a touring car for the Manager (to be rebuilt into an emergency truck), two 20-horse power runabouts, which were used by the superintendent and the new business mana-

ger, 4 low-powered runabouts, for the complaint and maintenance men, and 5 motor-cycles for foremen, inspectors and street clerks. Some of these cars saved their cost many times over during the construction period. Those familiar with the situation will remember the Old Colony Gas Company took over franchises which within a short time would have expired through failure to supply gas within the time limit. To validate these franchises it was necessary to complete a great amount of work within a few months, impractical but for the aid of the automobile.

The 3-ton truck, during the first year, was operated day and night delivering pipe and supplies for the main gangs, moving heavy machinery from the railroad to the works, moving Italian laborers about the work and supplying their camps. Since then it has not been subject to such long hours, but is used for all the heavy work required, from hauling pipe for the mains to the supply of coal for the works. This truck is of chain-drive, equipped with speed governor, has extra long body, built to handle 40 foot lengths of pipe. Because of its great endurance and ability to be always on the road, this truck has been nicknamed by the old employees "Old Reliable." Despite its strenuous use it shows but little wear and has cost but little for maintenance.

The 2-ton truck was purchased in 1912, and operated part of the year and all of 1913. It is of worm-drive, and when purchased was equipped with steel worm, which soon wore out and was replaced by the makers with one of bronze. Since then it has been operated for over a year and the bronze worm shows but traces of wear. Due to some construction faults, since corrected, the maintenance of this truck has been higher than necessary, but it shows signs of great improvement in this respect. The worm-drive seems to have many points of advantage over the older chain-drive.

The 2 half-ton trucks are touring cars chassis, equipped with truck bodies. They are used for light storeroom deliveries, service and main work (outside of delivering pipe) and for emergency work. One weakness of these trucks is that they are too light and too speedy for their work if handled by any ordinary driver, but when handled by a careful driver give good satisfaction. A speed governor should be installed on any truck, and, if applied to these cars when new, would probably have saved considerable maintenance expense. One of these trucks should more correctly be rated as of 800 pounds capacity, the other as of 1,200 pounds.

The two 20 horse power runabouts were used by the superintendent and the commercial manager and, due to the great amount of work under construction, were on the road day and night, especially as they were often used by the various foremen of the distribution department.

The 4 low-powered runabouts, operated by the complaint and maintenance men, are small chain drive, 1-cylinder cars. Due to a faulty connecting-rod design, two of these cars "punched out" the tops of the cylinders and wrecked their engines, so that their maintenance is proportionately high. We feel that this fault has been overcome and that their cost per mile will be very low hereafter. They have been a great assistance in giving good service at the least expense, allowing our scattered districts to be as well cared for as a more thickly settled city.

The garage force and drivers are of great importance for the welfare and economy of automobile operation. It is very difficult to obtain a good all-round man for the garage. Most all of the garage men have their specialties—some good ignition men, some good machinists and assemblers, some know little about a carbureter, and some little about anything. At one time we had 4 different garage foremen in as many weeks, due to our inability at any reasonable wage to secure a good man.

To insure the proper attention being given our cars by the garage, we instituted a schedule of weekly inspection and monthly overhaul, as follows:

Weekly Inspection.—Weekly duties comprise the following points: Examine and take up any wear there may be in: 1. Connecting rod bearings. Drop lower half of crankcase or open handholes, and, grasping each connecting rod in turn, move it up and down if possible. If there is any play in the bearing, drop the cap, file off the shims evenly to an extent thought sufficient to take up the wear, and replace, drawing the cap up on the bearing until the shim is clamped tightly.

Manager's Car.

3-Ton Truck.

2-Ton Truck.

(*Continued on page* 282.)

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THOMAS J. CUNNINGHAM, SANFORD K. CAMPBELL, } Editors.

NEW YORK, MONDAY, MAY 4, 1914.

[OFFICIAL.]

Thirteenth Meeting, the Wisconsin Gas Assocciation.

WISCONSIN GAS ASSOCIATION,
OFFICE OF SECRETARY,
MILWAUKEE, WIS., April 16, 1914.

To the Members of the Wisconsin Gas Association: The Thirteenth Annual Meeting of the Wisconsin Gas Association will be held in the Hotel Pfister, Milwaukee, May 13th and 14th, 1914.

Aside from the fact that a number of interesting papers and addresses will be presented, other matters, of vital importance to the welfare of our organizalion, are in contemplation, the best and final solution of which can be arrived at only after careful and thorough consideration. The Wisconsin Electrical Association is expected to make overtures at this meeting asking consideration of the subject of combining with the Wisconsin Gas Association, and a committee, representing our organization, consisting of Messrs. W. E. Haseltine, R. B. Brown and Robert Young, has already been appointed by the President to give the matter some thought before the meeting. It is also quite probable that a request from gas men in Minnesota, to take in their territory into a joint Wisconsin and Minnesota Association, will be up for consideration.

In order to have the action of this meeting on both the subjects, as nearly as possible, representative of the unanimous sentiment of our organization, the fullest possible attendance is absolutely imperative.

Of the papers to be presented, we now have definite promise of one by Mr. Halford Erickson, of the Wisconsin Utility Commission, on "Depreciation;" one by Mr. C. R. Phenecie, of Green Bay, entitled "Some Points of Interest on High Pressure Gas Submarine Crossings;" one by Mr. D. G. Stroebel, of Ft. Atkinson, on "Equipment of Domestic Science Schools;" "Intensive Methods of Selling Water Heaters," by Mr. R. O. Jasperson, Milwaukee; "Measuring Gas in Large Quantities," by Mr. J. A. Wilson, Milwaukee; another paper, by Mr. R. C. Cornish, of Philadelphia, the subject of which has not yet been announced; a lecture, illustrated by motion pictures, showing "Modern Methods of Manufacture of Steel Pipe," by the National Tube Company; and one similarly illustrating the "Manufacture of Gas Ranges," by the Detroit Stove Works. In addition to the above other papers are still under negotiation.

Then there is the entertainment, to which the first evening of our convention will be devoted, and for the quality of which those in charge do not expect it will be necessary to make apology. Taking it all in all, the inducements are there for a record-breaking attendance; and, in anticipation thereof, I beg to remain,

Yours truly, HENRY HARMAN, Secretary.

[OFFICIAL ANNOUNCEMENT.]

Tenth Annual Meeting, Iowa District Gas Association.

IOWA DISTRICT GAS ASSOCIATION,
OFFICE OF THE SECRETARY,
DES MOINES, IA., April 18, 1914.

The tenth annual meeting of the Iowa District Gas Association will be held in Davenport, Ia., May 27th, 28th and 29th. The headquarters of the Association will be in the Kimball Hotel. Members are urgently requested to make early reservations. Mr. H. J. Carson, General Superintendent, Muscatine Lighting Company, is Chairman of the Committee on Arrangements, and will make reservations on request or furnish any other information desired. The following papers will be presented at the meeting:

"Circular 32 and the Report of Committee on Thermal Value and Candle Power made to the New York State Public Service Commission, Second District," by Mr. Austin Bush.
"Tar," by Mr. Alfred Hansen.
"The Storeroom," by Mr. Geo. G. Kuhn.
"Domestic Appliances," by Mr. C. W. Lockwood.
"The Elements of Gas Rate Making," by Mr. Henry I. Lea.
"Some Distribution Experiences," by Mr. W. H. Merritt.

The attention of the members of the Association is called particularly to this list of papers, which embody the most vital subjects before our industry to-day. In addition, the following standing committees will report: Manufacturing, Distribution, Construction, New Business and Public Relations. One whole day of the meeting will be held on board the Mississippi river steamer, "W. W." Other interesting entertainment features are being arranged.

G. I. VINCENT, Secretary.

BRIEFLY TOLD.

SPRING MEETING, THE EMPIRE STATE GAS AND ELECTRIC ASSOCIATION.—The Spring Meeting of the Empire State Gas and Electric Association was held in the Alerts' Club, Medina, N. Y., on Wednesday, April 22d, there being about 100 people, representing some 50 or 60 companies, present. Mr. J. T. Hutchings, President of the Association, presided. At the morning session the speakers were Assemblyman Cyrus W. Philips, of Rochester; Mr. Edgerton Parsons and Mr. Belden, of Buffalo, all speaking on the new Workmen's Compensation Law, which goes into effect July 1st. Mr. Philips explained many of the important features of the law, and answered numerous questions in regard to them; Mr. Belden discussed the subject from the standpoint of the liability insurance company; and Mr. Parsons explained a plan for mutual insurance for the gas and electric companies of the State. It had been expected that Compensation Commissioner, J. Mayhew Wainwright, would be present, but he found that complications connected with the organization of the Commission and getting the work started, would not permit it.

At the close of the morning session, luncheon was served at the Alerts' Club, following which visits were made to the power house of the local Company and to other points of interest in the town. Upon reconvening for the afternoon session, some time was devoted to discussion of the water power situation, both as regards proposed legislation in this State, and pending legislation at Washington. The Association's Safety Committee submitted a brief report, indicating the work which the Committee had undertaken. The delegates extended a hearty vote of thanks to Mr. A. Swett, President of the Swett Electric Light and Power Company, of Medina, and to his association, and the speakers of the day as well.

NEW YORK SECTION, GAS METERS.—The meeting last week of the New York Gas Meeters was their second annual "Ladies' Night;" and it was held at the "Castle Cave," on Seventh avenue, where a "Beefsteak Dinner" was enjoyed by some 70 ladies and "Meeters." The special committee having this session in charge got up a merry menu card with some appropriate quips, and the "Sprague Meter Company" bound the "Meeters Song Book," in a fac-simile meter cover. Not a thing could have been better. The aprons were big enough to cover the largest, the caps were jaunty, the food served was toothsome and abundant, the beer heady, cabaret was entertaining, and the spirit of "Good Fellowship" more in evidence than for a long time. Chairman Pettes presided as much as was necessary to keep the fun going, and Commissioner Brock was toastserver, confining the few speakers to short funny stories with plenty of hilarity. After this all went up the celler stairs to the dance floor and tangoed and trotted with rest for refreshments, and saw a lady and gentlemen professional demonstrate the latest in dancing. Some of the "Meeters" and their ladies did closely as well as the talent did, and that the interest was sustained is evidenced by the lateness of breaking-away—when we went out they locked the doors. Altogether the most successful thing the Meeters have pulled off.

SOUTHERN GAS ASSOCIATION CONVENTION.—The Southern Gas Association's meeting, at Mobile, last week, was quite a success, both as regards attendance and interest, under the able direction of President James Ferrier. After a spirited contest between Charleston, Birmingham and Columbia, the former city was selected as the next place of meeting. Mr. C. R. Dawes, of Mobile, who was in line, declined to accept election as President, and the following were chosen as officers for next year:

President.—S. E. DeFreese, Chattanooga, Tenn.

Vice-Presidents.—L. J. Davis, Mobile, Ala.; E. M. Osbourne, Talladega, Ga., and S. J. Patterson, Meridian, Miss.

Secretary and Treasurer—E. D. Brewer, Atlanta, Ga.

A Rousing Mass Meeting.—The scientific and engineering men of Philadelphia are preparing for a rousing mass meeting, to be held the evening of May 15th, in and on the Continental Hotel Roof Garden, at which many prominent engineers will give short addresses, while the time will be spent as an informal smoker, in which speeches, music and general entertainment will be the features. As many as 20 national and local societies will be represented, in which there are fully 4,500 members in and near Philadelphia, many of whom are among the noted men of the world, in the especial branches of their profession. This will be the first of a regular series of general meetings and no long programme will be attempted, but rather a get-together meeting to inaugurate an Engineering Congress each year. The speakers who thus far have promised to be present are Dr. Steinmetz, of the General Electric Company, noted in the electrical world; Mr. Walton Clark, of the United Gas Improvement Company, President of The Franklin Institute, which has a world-wide reputation among engineers and physicists; Dr. A. Crombie Humphreys, President, Stevens Institute of Technology; widely known as a technical educator; and Mr. James Mapes Dodge, of Philadelphia, whose reputation and ability as a toastmaster are enough to require the revision of the building laws of the city, as regards roof garden parties; but at this meeting the number of guests is to be limited to a reasonable factor of safety, and though thousands would be welcome, the space will permit but a few more than 600 guests. The Committee expects to have many more speakers, in addition to those mentioned. Prof. George A. Hoadley, Swarthmore College, is Chairman of the General Committee; Mr. L. B. Eichengreen, Secretary, and Mr. C. C. Tutwiler, Treasurer. Other members of the Committee are: Dr. R. B. Owens, Secretary, Franklin Institute; Mr. J. A. Vogleson, Chief of the Bureau of Health; Mr. Joseph D. Israel, and Mr. H. A. Hornor. Tickets may be obtained, at $2 each, from Mr. C. C. Tutwiler, 1630 Real Estate Trust Building, or from Dr. R. B. Owens, Franklin Institute, or from The Engineers' Club, Philadelphia. Members of the National engineering and scientific societies of other cities are cordially invited to join the gathering and will be welcome, unless they subscribe too late, in which case regrets will be in order.

Year's Gain by Public Service Corporations.—We are indebted to the courtesy of the "Financial World" for an advanced copy of the Fifth Annual Public Service Corporation Review, by 286 leading companies for the year 1913, the showing made must prove very gratifying to all interested in this field of enterprise. Gross earnings were $866,416,400, or $54,857,676 greater than a year ago, an increase of 6.76 per cent.; net earnings were $370,801,186, a gain of $19,492,267, or 5.55 per cent.; and surplus, after all allowances for fixed charges and dividends, was $81,113,567, a gain of $2,655,893, or 3.54 per cent. During the year these 286 companies, disbursed in interest on bonds, including all other charges, $150,223,407, which was $10,787,446, or 7.73 per cent. more than a year ago; and in dividends there was paid $130,777,354, $5,881,041 greater than in 1912, or a gain of 4.72 per cent. The surplus over all charges and dividends shows a smaller ratio of increase, due to the fact that during the year the 286 companies increased their bonded debt by $87,820,793, the charges of which absorbed profits and cut into the surplus account. This increased indebtedness was incurred principally for improvements and extensions, which have not yet had much of an opportunity to develop additional revenues, but when they get fairly into play they are expected to add proportionately. Statistics indicate that the 286 companies have outstandiag $2,151,842,261 in bonds; preferred stock of $592,007,950, and common stock of $2,216,766,418. Here is an investment in public service corporation enterprises covering gas, electric light and power, telephone and telegraph, street railway and interurban transportation corporations of over $4,900,000,000. No stronger proof could be asked to support the argument that, next to the steam railroads, the greatest volume of capital has flowed into public service enterprises. The fact that the business has steadily developed into larger proportions each year, has shown the wisdom of this form of investment, and of all industries none has evidenced a better ability to withstand adversity.

Pennsylvania Association Committees.—President L. R. Dutton has announced these appointments:

Public Relations Committee.—J. H. Keppelman (Chairman), L. S. Williams, W. R. Rhodes, J. B. Klumpp, Grier Hersh.

Finance.—H. H. Ganser (Chairman), J. L. Mather, H. L. Dutton.

Programme.—J. E. Philbrick (Chairman), L. D. Spragle, C. H. Gotwals.

Entertainment.—R. J. Rolston (Chairman), Griffin Gribbel, Stanley Grady, C. E. Bartlett.

Membership.—F. F. Duggan (Chairman), M. N. Bailey, H. J. Gaylord, C. A. Young, N. W. Belmuth.

Uniform System of Accounting.—J. H. Keppelman (Chairman), G. W. Curran, J. B. Shattuck, B. F. Cresson, W. R. Rhodes, L. R. Dutton.

CURRENT MENTION.—

"T. D. M.," writing from Green Bay, Wis., under date of the 28th, among other things, remarks: "I was surprised on arrival here this morning, to hear that Mr. F. E. Newberry had resigned the post of Superintendent of the gas division of the Wisconsin Public Service Company, the same to be effective as of the first of May. I understand that he proposes to develop a new gas enterprise, in which he became interested some months ago, and over which he had a consultation with Mr. Clement C. Smith, President, the Public Service Company, prior to his departure for Europe, so it will be noted Mr. Newberry would have taken this step prior to the President's vacation. In fact, he remained to permit Mr. Smith to make that trip in comfort. Mr. Newberry is not prepared to say in what city the development is to be tried out. He had been with the Green Bay Company since 1906, and it has prospered under him greatly, especially in respect of the making of many well directed distribution lines. I may add that the move Mr. Newberry has taken looks good to me as a future proposition, and names of places and persons involved will be made public in a few days."

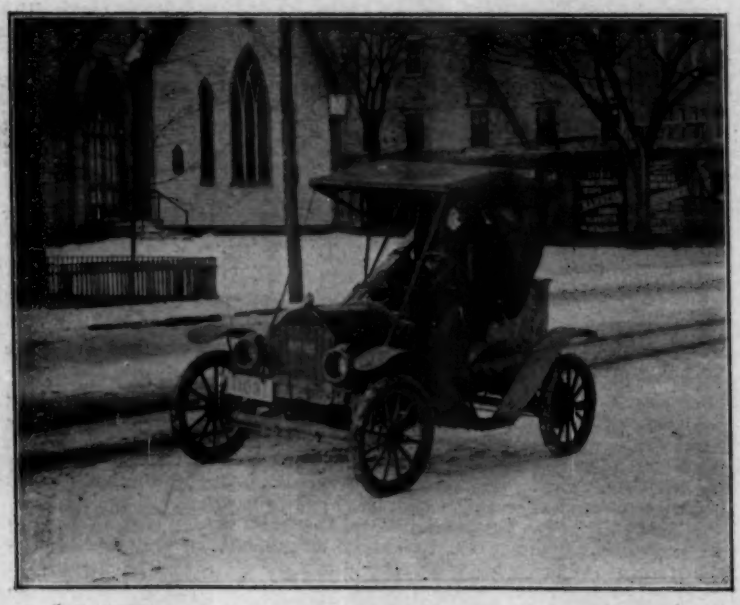
"Let the city authorities work out their own salvation," said Circuit Court Judge McGinn, in declining to issue an injunction against the Portland (Ore.) Gas and Coke Company, to restrain the latter from constructing a gasholder on the block bounded by East Eleventh, Division, East Twelfth and East Clinton Streets. Those who asked for the injunction were the Trustees of the St. Paul's Lutheran Church, the Ford Motor Company, George A. Cameron, Henry Lohn and M. Hager. The basis on which the injunction was asked was the citing of an ordinance, passed some months ago, which declared that no gasholder should be built on property within 250 feet of a church or a residence.

"Going value," as a factor in respect of public service corporations, when the rates charged by these are being questioned, according to an opinion not long ago delivered by the Court of Appeals in the case of the Kings County Lighting Company against the Public Service Commission, New York District—the opinion and definitions being prepared by Mr. Justice Nathan L. Miller. The appeal was by permission from an order of Appellate Division, first reversing a determination of the Commission, fixing the minimum rate to be charged for gas by the Company in the Thirtieth Brooklyn ward, at 85 cents per 1,000 cubic feet. The Commission found the value of the property of the Company to be $2,500,000, and the new rate would give an interest rate of 7½ per cent. The Commission refused to include in the valuation $600,000 as the going value of the plant; $200,000 as the value of street repavements, and $35,000 as the annual of appreciation of its real estate. The Appellate Division reversed the order because these were not included. The Court holds there is no logical difference between allowing for "going value" in condemnation proceedings and in rate making. "Rate making is difficult; but that will not justify confiscation," declares the Judge, "The rate making power must allow for the losses during the early years, which are lean years. It takes experience to develop a business and experience is probably expensive. Judge Miller holds: "I define 'going value' for rate purposes, as involved in this case, to be the amount of deficiency of net earnings below a fair return on the actual investment due solely to the time and expenditures reasonably necessary and proper for its present stage, and not comprised in the valuation of the physical." "Going value" is to be appraised by showing "the actual experience of the Company, the original investment, the earnings from the start, the time actually required and the expenses incurred in building up the business, all expenditure not reflected by the present condition of physical property, the extent to which bad management or other causes prevent or deplete earnings, and any other facts bearing on the question, keeping in mind that the ultimate fact to be determined is not the amount of the expenditures, but the deficiency in the fair return to investors, due to the causes under consideration." The Court declares that the Company, in calculating the value of the property used in the public service, or of capital actually expended, shall not be allowed the cost of paving now in the streets, but not there when the mains were laid; nor is the Company allowed for appreciation in value of its land. The order, in so far as it remits proceedings to the Public Service Commission, is affirmed without costs, all the judges concurring.

(*Continued from page 279.*)

Light Delivery Truck.

Superintendent of Distribution's Runabout.



I. B. M. Runabout.

2. Main bearings. As these rarely require attention, should only be given a weekly inspection. Put a crowbar under the fly-wheel and pry up and down. This will locate any looseness in the bearings.

3. Jack up each wheel. Examine steering knuckles. Shake wheel to find any looseness in steering king-bolt bearings. Test the breaks by applying them and endeavoring to turn the wheels. Tie up one rear wheel so that it cannot turn, and spin the other with both brakes off, to see if the differential works silently and freely.

4. Road wheel bearings, if adjustable. Jack up each wheel and, taking hold of spokes on opposite sides, shake the wheel. There should be no play. If play is noticed, turn up the axle nut until it disappears.

5. Steering joints. Test these for play by turning the hand wheel. If there is considerable lost motion, examine each of the joints for jammed springs or loose nuts. In each case examine the cotter on the nut.

6. Inspect clearance of tappets. It should never be possible to insert two thicknesses of an ordinary business card between the tappet and stem. Clearance should equal the thickness of a standard business or postal card.

7. Take cover off gearbox and differental housing. Test for loose bearings, by taking hold of shafts and shaking them. If shaft has play, locate loose bearings and adjust in the same manner as above. See that all washers and cotters are in good shape. Watch with especial care the bolts on the differential.

8. Every second week oil the magneto according to the manufacturer's instructions. The weekly inspection is not an overhaul, it is merely a more elaborate inspection than the daily one.

One-half day per week should be devoted to this inspection of cars.

Monthly Overhaul.—1. Cylinders should be tested for compression. To test the compression in the cylinders, use a pressure gauge if possible, substituting it for the pet-cock. Turn engine to the compression point of the cylinder in question, observing when the point of greatest compression is reached. At this point hold the engine. A very simple method of holding the motor at any given point is to put the gearset in high and apply the emergency brake. When the desired point is reached engage the clutch. Let the motor stand a while, during which time other operations may be performed, and then note if the pressure has fallen appreciably. Try this on all cylinders. If a pressure gauge is not obtainable, test the compression by turning the motor up to the compression point and holding it there by hand. Hold it just short of the compression point for a few moments. Any momentous leak of compression will make itself felt by an easing of the resistance to the hand. Cylinders found to lack compression should have their valves and valve seats looked after. If pitted or carbonized, they should be cleaned and ground. If they are warped, they should be thoroughly ground. If they are in good condition, the spark plug and pet cock should be examined as to tightness. If these are found O.K., the pistons should be taken out and the rings and cylinder walls examined. If the rings are sprung or worn, they should be replaced. If scored, or if they have lost their temper, they should be reground and retempered. If the cylinder is scored, it should be very lightly reground. If this does not do the business and deep grinding is required, the old pistons will have to be discarded and oversize pistons and rings secured.

2. Cylinders should be decarbonized, either by the use of a chain, by kerosene, by scraping, or by any of the proven methods of dissolution or burning, with which the driver may happen to be conversant.

3. The platinum points of the magneto should be filed slightly to remove pitting. Thin files are supplied for this purpose by manufacturers.

4. Empty oil from crankcase and clean with a solution of 3 parts kerosene and 1 part gasoline. Leave the crankcase open to dry over night and fill with clean, fresh, oil in the morning. Same operation should be performed on the gearbox and differential housing every 2 months.

5. Look for worn minor bearings, such as on spring shackles, control shaft brackets, etc. Replace those which are removable, if worn.

6. Inspect radius rod, jackshaft, and driveshaft bearings very

Garage Machine Shop.

QUESTIONS	COMPANY #1	COMPANY #2	COMPANY #3	COMPANY #4	COMPANY #5	COMPANY #6	COMPANY #7	COMPANY #8
1 HOW MANY MOTOR TRUCKS DO YOU USE?	TWO	TWO	FOUR	ONE	FOUR ELECTRIC TRUCKS	ONE	ONE ELECTRIC ONE PACKARD	1 WHITE 1 BUICK
2 WHAT IS THEIR LOAD CAPACITY?	1-1500 LBS 1-1 TON	700 LBS BESIDE CHAUFFEUR	2-1000 LBS 1-2 TON 1-3 TON	1500 LBS	1-2000 LBS, 1-1000 LBS 2-700 LBS	1500 LBS.	PACKARD 3 TON	1900 LBS EACH
3 WHAT NUMBER OF MILES DO THEY COVER PER DAY?		30 MILES	1 LIGHT TRUCK ON ASSORTED RUNS 18 MILES AVERAGE TRUCK ON 30 MILES LARGE TRUCKS ON LONG RUNS UP TO 45 MILES	20 MILES (NO RUN REPORTED)	2000 LB TRUCK RUNS 80 MILES, OTHERS FROM 30 TO 35 MILES.	35 TO 50 MILES	25 TO 30 MILES	WHITE ARE 30 TO 35 MILES QUICK USED AS A SPARE TRUCK
4 DO THEY OPERATE EVERY DAY IN THE WEEK?		HOLIDAYS SUNDAYS & HOLIDAYS	SIX DAYS A WEEK	YES	EVERY DAY EXCEPT SUNDAY	SIX DAYS	YES	EXCEPT SUNDAY
5 HOW MANY LOST DAYS DUE TO REPAIRS BREAKAGE ETC. DO YOU KEEP PER MONTH WITH YOUR MOTOR TRUCKS?		LOSE 2 DAYS PER TRUCK PER MONTH TAKING BOTH IN OPERATION ABOUT 2½ YEARS		PRACTICALLY NONE	VERY FEW LOST DUE TO ENGINE TROUBLE IS BREAKAGE OF BATTERY JARS, CAUSING DELAY OF 2 OR 3 HOURS	3 TO 6	1 5%	WHITE TRUCK OUT OF COMMISSION ABOUT 2 WEEKS IN 12 MONTHS TWO MOTOR OF THIS FOR SOME REASON
6 WHAT DOES GASOLINE COST YOU PER GAL. AND WHAT IS YOUR MONTHLY BILL? HOW MANY MILES WITH ALL YOUR TRUCKS AGGREGATE & FINALLY WHAT IS YOUR GASOLINE COST PER TRUCK MILE?		GASOLINE HAS ON ALL SUMMER BUT LAST FEW MONTHS HAS BEEN 17¢ MONTHLY BILL = $40.00, TRUCKS RUNNING 700 MILES PER MONTH EACH COST PER TRUCK PER MILE = 1.95	GASOLINE COST = $.15	GASOLINE COST = 12¢ TO 15¢ PER GAL 1500 MILES PER MONTH, COST PER MILE = 1.95	INCREASE COST PER MILE = 0.015 IF FOR CURRENT 2½ % CHARGE ON BASIS OF 3½ % FOR MILEAGE??	GASOLINE COST = 1.85 PER MONTH BILL = $12.00 GASOLINE COST PER MILE = 3.9 ¢	GASOLINE COST = 18¢ MILEAGE = 400 GASOLINE COST PER MILE = 4.5	GASOLINE COST = 12¢
7 WHAT MAKE, SIZE, & TYPE OF TIRES DO YOU USE, AND WHAT IS YOUR TIRE COST PER TRUCK MILE?	GOODRICH 34×4 AB	(1) 36×6 FRONT 30×3½ REAR (2) 34×4 FRONT, 30×3½ REAR 30×5 COST PER TRUCK MILE FOR TWO YEARS = 2.7¢	LIGHT TRUCKS FRONT PNEUMATIC TIRES REAR, SOLID TIRES. LARGE TRUCKS HAVE SOLID TIRES FRONT & REAR, SINGLE ON FRONT & DUAL ON REAR	32 × 4 FIRESTONE SOLID TIRES AND 6.0 PNEUMATIC COST PER MILE = 2.97¢, INCLUDING TIRES = 4.96¢	GOODRICH SOLID TIRES, 36 ON 2000 LB, 8 ON 1000 LB TRUCKS 36 ON SMALLER CARS, UNSATISFACTORY FOR LIGHTER CARS, PNEU. WAS NOT REMOVABLE, BUT HAVE EXPERIMENTED	34×4½ UNITED STATES	34×4.5 39×4 TIRE COST PER TRUCK MILE = 5¢	36×4½ GOODRICH SAFETY TREAD
8 WHAT AREA OF TERRITORY OR MILES DO YOU COVER FROM YOUR OFFICE?	25 MILES OF GAS MAIN, 25 MILES OF STREETS SERVICED BY MAINS	ABOUT 25 OR 30 MILES	ONE CENTRAL 25 MILE CIRCUIT, SERVICE TRUCKS ABOUT 15 MILES	2½ MILES		25 SQUARE MILES		18 SQUARE MILES
9 HAVE YOU EXTENDED YOUR ZONE OF WORK BY THE USE OF MOTOR TRUCKS?		NO	NO	YES, ABOUT DOUBLE THE AREA		NOT YET	YES	YES
10 HOW MANY HORSE VEHICLES HAS YOUR PRESENT MOTOR TRUCK DISPLACED? STATE THE PLACE OF EACH VEHICLE OR WORK AS THE TRUCK HAS BEEN BROUGHT ABOUT BY MOTOR TRUCKS.		BELIEVE IT WOULD TAKE 5 SINGLE TEAMS TO DO THE WORK OF THESE 2 TRUCKS.	TRUCK TAKES THE PLACE OF 2 TEAMS ON CITY, OF 3 TEAMS ON COUNTRY. THIS LATER CONDITION APPLIES TO LONG DISTANCE WORK	TWO	THESE TRUCKS HAVE SUPERSEDED 8 HORSE DRAWN VEHICLES, & INCREASED THE WORK DONE 50 %, WITH A REDUCTION OF LABOR	TWO HORSES	FOUR TEAMS	WHITE TRUCK TAKES THE PLACE OF 3 OR 4 HORSES & WAGONS
11 DO YOU GARAGE YOUR OWN TRUCKS OR HAVE THEM KEPT AT A PUBLIC GARAGE, & WHAT DO YOU ESTIMATE ONE GARAGING COST PER TRUCK PER MONTH?	ESTIMATED AT $4.00 PER MONTH PER CAR, EXCLUSIVE OF WAGES	HAVE OWN GARAGE	GARAGE CHIEF CARE WORK IS DONE BY DRIVER CONSISTING OF 6 TEAMS THAT ARE IN TOGETHER	HAVE OWN GARAGE	ALL TRUCKS KEPT IN OWN GARAGES	GARAGE OWN TRUCK	HAVE OWN GARAGE	USE OWN GARAGE
12 WHEN YOU HAVE BREAK DOWNS OR REPAIRS TO BE MADE, ARE THESE DONE BY YOUR DRIVERS, OR IN THE PUBLIC GARAGE OR AT AN OUTSIDE REPAIR SHOP?		SMALL REPAIRS ARE DONE BY CHAUFFEUR & LARGER ONES AT AN OUTSIDE GARAGE.			ALL REPAIRS MADE IN OWN REPAIR SHOP	REPAIRS USUALLY MADE BY DRIVER IN OUR GARAGE	NO OWN REPAIRING	REPAIRS MADE AT GARAGE OF AN ADJACENT GAS COMPANY
13 WHAT SALARY DO YOU PAY YOUR TRUCK DRIVERS, & HOW MUCH GREATER IS THIS THAN YOU PAY YOUR HORSE DRIVERS?	$2.50 PER DAY NO HORSE DRIVERS	PAY ONE DRIVER $12.0 THE OTHER $9 WHICH IS ABOUT THE SAME AS THE HORSE DRIVERS' SALARY	TRUCK DRIVERS GET $ 60 TO $ 75 THE HORSE DRIVERS GET $ 60	FURNISH DRIVER HIMSELF	DRIVERS RECEIVE SAME PAY AS GAS DRIVERS OF HORSE DRAWN VEHICLES	FURNISH FITTER DRIVES TRUCK	$17.00 PER 7 DAYS	$ 15.00 TO $ 18.00 PER WEEK
14 (a) WHAT SAVING DO YOU CONSIDER THAT YOU HAVE MADE IN THE TYPE OF TERRITORY IN WHICH AUTOMOBILES? (b) DOES THIS SAVING OFFSET ANY POSSIBLE INCREASE CAUSED BY THE ADOPTION OF AUTOMOBILES		(a) YES, SAVING THAT GIVEN, IS A CONSIDERABLE AMOUNT (b) COST PER MILE OF GAS TRUCKS IS CONSIDERABLY LESS THAN THAT OF HORSES DRAWN VEHICLES, ESTIMATED CONSIDERING THAT GIVEN IN THE TIME OF THE TRUCK	DOES NOT CONSIDER ANY SAVING EFFECTED IN WORK, DISTANCE WORK, BUT THINKS PERSONAL PRESENCE OF DRIVER EQUIVALENT AT HIGH EARNING	(a) UNDECIDED (b) WORK COULD NOT BE DONE WITH HORSE TEAMS	SAVINGS CONSIDERED BE NOT NOTICED FROM HORSE DAYS TO POWER ONLY IN ONE, 2 TRUCK RUNS HAVE SHOWN LESS COST OF HORSE DRAWN VEHICLES = 1.94 A.M. OF DUE TRUCK, IS ON HIS DUE COST OF OPERATION, WITH DRIVER AT LABOR = 1.94 IN EXCESS OF COST	(a) TRUCKS DO	(a) 4½ (b) YES	THIS IS IMPOSSIBLE TO GET ALONG WITHOUT THE TRUCK

carefully, paying particular attention to adjustment. This monthly inspection should not take more than 1½ days, and when in progress, the regular weekly inspection is done away with, the two being combined in one. If the weekly inspection and monthly overhaul be done in a thorough manner, a regular overhaul need not be made nearly so frequent and so more regularity in service may be observed.

This inspection is made by the garage foreman in person, who is held responsible for the general condition of all cars. The drivers regularly assigned to a car are personally responsible for the condition of such car, seeing that it is in good order before taking out of the garage. A good driver can keep his car always on the road with little expense, while one who is careless can change a truck into a white elephant in a very short time.

One great item in an automobile delivery is a delivery system. Without it a truck can waste a great proportion of its time loading and unloading. By having its load ready in boxes for rapid handling, the driver and his helper can spend but little time at stops, then, if care is taken in routing, it is comparatively easy to get efficient service from the trucks. A good recorder is of material assistance in promoting the delivery efficiency.

One of the important items in motor operation is the cost of tires. No other part of a car suffers more from careless handling and inattention, and there is practically no reliable check upon a driver's care or abuse. Overloading, speed, road conditions, inflation and truck design all enter into relations of tire costs. The nature of the roads and of the service, the weather conditions and handling of the car all enter into the estimation of fuel efficiency, whether gasoline or electricity.

The useful life of a car is ended when its total annual cost, including all charges, exceeds the total annual cost of a new car plus the interest on the investment of the old. The life, assumed for a car at the best, is only a rough guess for it must be remembered that so many conditions, variable at the best, enter into its consideration.

Some very good information on the various elements of expense in motor truck operation and the experience of many users, can be obtained from the "Bulletins" of the Massachusetts Institute of Technology, which will be sent gratis to any one interested in the subject. In these bulletins also are many comparisons between horse and motor truckery.

There are many interesting articles appearing in the various technical papers, and in the reports of our various technical societies. The replies to questions submitted to a number of New England Companies indicated that a great many were still using the horse, and many who were using automobiles kept no cost record.

Drivers' and helpers' wages vary with the locality, from $2 to $3 a day for drivers, and $1 to $2.50 a day for helpers. Some of the gas companies of New England maintain their own garages, while others turn their car over to the "mercies" of a public garage.

I give here a tabulation of the replies received from a number of New England gas companies. In summary of these reports it would seem that but a small proportion of available time was lost by the trucks, due to repairs, breakage, etc. Compare this with horse delivery, with its days off for lameness, heat and sickness, shoeing, etc.

One company covers over 85 miles of wires and 55 miles of mains with but two trucks. How many horses will be required to cover this mileage? The replies vary from 4 horses and wagons to 2, replaced by 1 truck, and all indicate a saving in time, an increase in work accomplished and ability to give better service.

In reply to questions sent out to various companies, asking what depreciation is charged off, the various answers indicated a lack of uniformity of depreciation charges, varying from no charge to one of 33⅓ per cent., as charged by at least two companies.

Discussion.

The President—This automobile matter has been handled very nicely. Does any member care to discuss this paper?

Mr. Otten—I was wondering whether they tried both solid and pneumatic tires on the same truck in the same locality.

Mr. Smith—We did not try any different tires, except in the case of dual and single, solid tires. Our two large trucks, when they

came in, were equipped with single tires. On the rear wheels we put on dual tires, but they were in both cases solid.

Mr. Bird—I should like to hear the approximate operating cost of the different cars that Mr. Smith has spoken of; that is, the cost per mile for each kind of truck.

Mr. Smith—I prepared a good many figures of the cost per mile, but they varied very much. It is hard to keep a good, reliable record of the cost, and they varied for different sizes of trucks. One truck in particular, some of the time ran 10 miles on a gallon of gasoline, while at other times it ran as high as 16, depending on the handling. I couldn't get a good average cost.

Mr. Bird—Mr. Smith deals primarily with gasoline trucks. I would like to know if any member has tried electric trucks as compared with gasoline trucks, and what the experience was relative to economy.

Mr. Otten—Electric wagons were used for distribution and shop-work in a city of 90,000, which had fairly good roads. We found we could keep the cars on the road every day for the whole 10 hours. We had used a light gasoline wagon before, and had a whole lot of trouble with it. The electric was much simpler to operate, and the men got along much better with it.

Mr. Barnes—We have had just the opposite experience in Cambridge. We had an electric truck that would start in the morning and get back at noon, and, while the man was having his dinner, we put it on to charge up as much as it would during the noon hour, but oftentimes, between 5 and 6 o'clock, we had to tow that truck in. We tried all sorts of batteries, finally putting it up to the manufacturer to give us the battery that would do the work. We have not yet succeeded in getting it.

The President—Mr. Allyn, should you care to tell the gentlemen our methods in Providence in regard to records of automobiles, what they use, etc.?

Mr. Allyn—I have not been able to keep any complete record of automobiles, because I have had some of the same experience that Mr. Smith has had in building over machines, with different operators handling them, etc. Speaking of built-over machines, I think people make a mistake in so building. Too many times when it is built over it is not the proper machine for the work, and you may have a 40 or 50-horse engine and a big touring car, when built over will only do the work of a machine that a 20 or 30-horse power engine would do. In buying commercial cars I think people should use good judgment in such selecting, taking the right car for their work and not try to build touring cars into commercial cars.

The President—Mr. Morrison, will you enlighten us a little on this matter?

Mr. Morrison—I have some figures for cost of gasoline per mile, but have no complete figures of the total cost. These figures may be interesting. Three 1,500 pound trucks, running 1,400 miles per month, average 1½ cent per mile for cost of gasoline. One light delivery, running 700 miles, cost 1½ cent. A 2 ton truck, running 1,050 miles, cost 3¾ cent per mile for gasoline. We have one light delivery wagon that takes the place of 2 horses and 4 men. The cost per order is about cut in half; 30 cents as against 14 or 15 cents. The 1 light delivery and 2 men take over the work of 2 horses and 4 men. The cost of tires per mile is pretty hard to figure; but they guarantee you about 3,500 miles. If you run 3,500 miles on a $35 tire it is 1 cent a mile, or 4 cents a mile for 4 tires per car. I don't think you can safely figure on anything less than that.

Mr. Snow—I cannot give any figure contrasting gasoline and electric trucks, but Mr. Morrison having read some figures on the cost of gas cars per mile for gasoline, I have some figures showing the cost per mile for electric trucks. We have 7 electric trucks in commission in our Company; the oldest, I believe, is 5 years years old this coming summer. Beside the trucks we have 2 electric runabouts. Here is a record for the last 6 months of 1913. There was a car, 2,000-pound capacity, that ran 2,575 miles. The kilowatt consumption was .945 per mile. Anybody can take the kilowatt consumption and put any price on it he has a mind to. The next one is a 1,000 pound truck. That took 1.036 kilowatts. The first car had averaged 19.6 miles a day, the next one 15.7 miles. The next 1,000-pound truck took .45 of a kilowatt per mile, averaging 27 miles a day. The next one is a 7,000 pound truck, and that averaged .964, and 17.9 miles a day. A runabout, used for trimming arc lights and for patrolling, averaged .339 on an average run of 32.2 miles a day. Another 1,000-pound truck averaged .494, averaging 26.6 miles. Another 1,000-pound truck averaged .734, averaging 28.1 miles. Another one, a 4,000-pound truck, averaged 9/10 of a kilowatt per mile. That ran only 14.1 miles per day. I will say for the electrics that they run all day, and we don't have to send gasoline cars after them. We are more apt to send them out after the gasoline touring cars. The repairs on the electric trucks are necessarily much less than on a gasoline car, but when it comes to renewing the batteries, in the case of lead batteries, once every 2 years, I have not anything from my records that will tell whether repairs on gasoline cars are more than the renewals of batteries. They are much simpler to run, they run more steadily, they are reported at least to be easier on tires, and they certainly are easier on the wear-and-tear of the trucks themselves.

The President—Any further questions or information on this matter?

Mr. Otten—I should like to bring up the matter of tires again. Our manager has nobby-tread tires on his touring car, and I have some on my runabout. Another runabout, that we use for meter work, has smooth tires. I ran 4,000 miles with one puncture, and the manager had the same result. On our meter wagon we had punctures every ½ hour some days, mostly caused by tacks. I did not know whether we had had a stroke of good luck with our nobby-tread tires, or whether it is general experience that it is best to buy the heavier tires.

The President—Mr. Allyn, I consider you an expert on tires.

Mr. Allyn—I have had quite a lot of experience driving machines with say 32″ × 3½″, 33″ × 4″, 34″ × 4″ and 36″ × 4½″ tires, and I must say from my experience with the largest sized tires, such as 34″ × 4″ and 36″ × 4½″, I have practically no punctures. With the smaller ones we used to have a great many. Of course, the nobby-tread will hold your tire off the road, thereby preventing small tacks and nails from injuring the tires, and I have found that, with a small sized tire with a nobby-tread, you would be liable to have less punctures than you would with a tire with a smooth tread.

Mr. Smith—We adopted non-skid tires almost exclusively, for after some experience we found the extra rubber more than offset the extra cost.

Mr. Otten—Would that be on all 4 wheels, or just on the rear wheels?

Mr. Smith—On all four.

Mr. Allyn—I have had enough experience with machines to say that, as far as our town is concerned, 3 years would be the first life of an automobile, and I think anyone who runs a machine much over 3 years will find repair expenses prohibitive. A truck I bought late last fall has run 3,300 miles to the present time, and has not been laid up a day. The tires are in good shape at the present time. We keep very close tabs on the cost of running that truck. As I say, it is a new truck, and has been successful up to the present time.

The President—If there is nothing further to be said on this matter, in this instance I will again waive formalities and extend to Mr. Smith a unanimous vote of thanks for his paper.

The following

REPORT OF COMMITTEE ON PRESIDENT'S ADDRESS

was read and adopted:

The President's address offers us much that is interesting and instructive, and the members will do well to keep always in mind his references to the steady growth of the gas industry and the consequent changes in methods both of manufacture and distribution. If New England is to hold her proud position in the front yard, she must keep closely in touch with, and be ready to adopt, all the improvements in the science of gas making, for a science it has now become.

The Committee would particularly endorse the President's remarks upon the desirability of the substitution of the calorific value of gas for the illuminating value in the statutory requirements where the industry is under State regulation, believing that continued agitation of this question will in the near future produce the desired change.

The Committee heartily concurs in the President's criticism of the existing accommodations for our annual meetings, and for that reason finds itself debarred from endorsing his opinion that he should not be re-elected. If this hotel is to be entirely demolished, the undertaking had better be left in the hands of Providence!

ALBERT M. BARNES,
ROBERT E. WYANT,
WALTER F. NORTON. } Committee.

ADJOURNED.

The President—The time has past arrived for closing the session, and I wish to say I am under obligations to the Secretary for his support, also to the Board of Directors and the members. Any further business? I declare the meeting adjourned.

Special English Correspondence.

COMMUNICATED BY NORTON H. HUMPHRYS.

SALISBURY, ENGLAND, April 10, 1914.

A Question of Liability.—Coal Miners' Unrest.—Some Parliamentary Returns.—The Coke Problem.

An interesting question of liability, as between gas companies and local authorities, recently arose in connection with a compensation claim for personal injuries at a London County Court, due to tripping over a loose paving stone. In this case the claim was not large, but the question involved is of great importance. The general custom, when a gas company opens paved thoroughfares for the purpose of laying or repairing gas mains or services, is for the company to fill in the subsoil, temporarily replace the top crust, and promptly give notice to the local authority, who reinstate the surface to their own satisfaction, charging the cost to the gas company. The curious feature is that, under the Gas Works' Clauses' Act of 1847, the gas company are to make good any surfaces that they have disturbed with all convenient speed, yet it is not disputed that the local authority are the proper body to actually do the work. In July last, the Commercial Gas Company laid a main in Canton street, Poplar (a closely inhabited district in the north part of London), and the particular section in question was finished, so far as the gas company was concerned, on the 26th. The earth was filled in, the paying stones replaced loosely, and notice immediately given to the local authority. This body, however, did not move in the matter for several days, and on August 5th, 9 days after receipt of notice by them, the plaintiff happened to be passing along the street, and fell, by reason of a loose paving stone projecting 1¼ inches, thus sustaining personal injuries. The defence was that the gas companys' liability ceased within a reasonable time, say 48 hours after notice to the local authority; but it was held by the judge that they had accepted some sort of responsibility, by specially sending men on the second, and again on the fourth of August, to level the loose stones, that in fact the accident was brought about by the negligence of these men, and judgment was given against the gas company. Notice of appeal was given, and if this is unsuccessful the position of the gas company in closely populated districts will be very peculiar. They must not complete the necessary repairs themselves, while at the same time they are liable to keep the surface in repair, until it suits the convenience of the local authority to attend to the matter, which means that they must keep a watchman on the spot, and laborers in attendance, for possibly several weeks. The position is anomalous, and should be settled by transferring the whole labor of reinstatement to the gas company, or making the local authority liable, such liability to commence with a reasonable period, say 2 or 3 working days after the notice has been received; and, for the convenience of the public, the reinstatement should be promptly completed. The case might be met by making it imperative for the local authority, if they elect to complete the reinstatement (at present it would seem that they are not under an actual obligation to do so) to carry out the work within 48 hours after receiving notice. In the event of non-compliance, the gas company to have the right to complete the work without further notice.

Recent legislation, with a view to the prevention of disputes in the coal fields, appears to have had rather a contrary effect. As previously remarked, ever since the coal strike of 1912, there is nothing but mutterings and growlings amongst the miners, and really it seems that for making a workman unreliable and discontented, it is hard to beat a rise in wages, coupled with shorter hours of labor. A small disagreement in Yorkshire has spread, until the whole district, comprising 170,000 men, are out on strike, and the struggle appears likely to be an obstinate one. Some of the collieries have accepted the men's terms, but have gained nothing by doing so, as work will not be resumed until the whole are either mollified, or have spent their strike funds. Fortunately, on account of the mild winter, most gas companies are at present overstacked with coal, and the cessation of deliveries over a month or so is a convenience rather than otherwise, seeing that coal due under contract has to be taken and paid for, even if it will not be wanted for another 6 months. There are also hopes of some reduction in price. Large contracts have been placed at a reduction of 2s. per ton, and a consignment of German coal, stated to be 250,000 tons, has been obtained on equivalent terms, by a London gas company. As there are still very general complaints about heavy stocks of coke, which cannot be expected to be reduced at this time of the year, some substantial reduction is imperative, and if not obtainable there is nothing to fall back on but an advance in the price of gas.

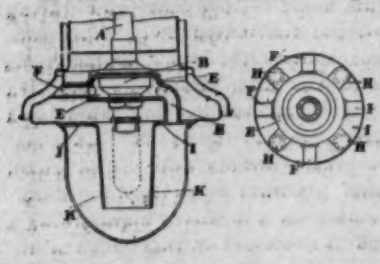
The Parliamentary returns for the year ended 31st December, 1912 have been issued, and as usual furnish some interesting information as to the progress of our industry. It will be remembered that this year's working was prejudiced by a 6 weeks' entire stoppage of coal supply, which in many cases necessitated some curtailment of the gas output. Notwithstanding this drawback, the increase on all leading items, such as capital paid up, receipts and expenditure, coal carbonized, gas made and sold, mileage of mains, number of consumers, and public lamps, is steadidly maintained. A better idea of the extent of such increase may be obtained by noting the advance over the last 10 years. Taking the companies first, and giving the approximate figures, the paid-up capital has increased 15 per cent., and the annual receipts, expenditure, and balance of net revenue, 25 per cent. The quantity of coal carbonized has increased 10 per cent., but this does not take account of the extended use of carbureted water gas. The figure for 1903 is not given, but during 1912, out of every 13,000 cubic feet of gas supplied, 2,000 came from the cupola, and not from the retort. The number of consumers has nearly doubled, on account of the introduction of the slot meter system, and the public lamps have been increased about 11 per cent. The capital expenditure and annual turnover show similar progress in the case of the gas works owned by local authorities. There is a larger increase as regards coal carbonized, about 15 per cent., apparently due to the fact that local authorities have not adopted water gas to the same extent as companies. They only use about one part, to 12 of coal gas. The explanation is that municipal gas works are mostly confined to localities where coal is abundant and cheap. In out of the way places, where coal is dear, the supply of gas is usually left to private enterprise. The total mileage of mains, including both classes, is nearly 38,000, supplying about 7 millions private consumers, and 750,000 public lamps. It is noticeable that several undertakings send out 50 per cent. or more of carbureted water gas, the maximum being 57¼ per cent., and during the coal strike some local authorities distributed 60 to 70 per cent. From which it is evident that the carbonic oxide bogey, which at one time assumed alarming proportions, has been effectively laid. In addition to the carbureted water gas, some 140 gas companies, and half that number of local authorities, own to the use of "other material," such as carburine, oil, or other suitable fluid, all of which goes against the consumption of coal. A fluid lends itself more conveniently for use as a balance wheel, as a means of maintaining a uniform composition of gas, which is necessary in these days of inverted incandescent burners, than a solid. Many gas engineers find that they can work within a margin of 1 or 2 tenths of a candle, which is not practicable with coal.

Mr. M'Nicholl, the President of the Manchester Junior Gas Association, in addressing the members on the occasion of accepting the chair, adopted a course that might be considered with advantage by future members, who either achieve the greatness, or have the greatness thrust upon them, of a seat at the head of the table. Instead of attempting an all-round commentary on current events, he confined his remarks to one subject. Time was when a fairly comprehensive view of the gas industry could be delivered within the space of 45 to 60 minutes; but that time has long gone by. To-day it is impossible to deal with the numerous data concerned, within double that space of time. And, considering that the number of inaugural addresses delivered in a twelvemonth is something like two dozen, and that current events are fully considered in our periodical literature, there is danger of unnecessary repetition and overlap. Mr. M'Nicholl took for his text "The Coke Problem." It would be difficult to hit upon a more opportune subject, and he did it full justice. After pointing out that the means of controlling the production of coke in sympathy with the demand are limited in extent, he remarked that the only course was to direct the surplus into other channels, by finding new markets for it. The methods to be followed were the same as are adopted when exploiting any new commodity, with a view to opening up a market for the same. First, we must ourselves be acquainted with the needs of the prospective customers, and be prepared to show that we can meet such needs with advantage. We must have a practical knowledge, not only of our own goods, but of possible competing lines; and we must follow perseveringly every practical and legitimate method of advertising and soliciting custom. If the question had been tackled by the same methods that are adopted for pushing and maintaining the sales of gas, the state of the coke market would be very different from what it is to-day. Sup-

pose a gas company, sending round a representative to solicit orders for coke, in any quantity from one cwt. to 100 tons, offering free samples, and assistance towards intelligent use. If coke was broken to suitable size, was moderately dry, and sold at a reasonable price compared with coal, there would be a good demand for use in the domestic fireplace. He referred to the importance of tests on a practical scale, in every district, as to the duty obtainable from coke, as compared with coal, and other available fuels. For manufacturing purposes, the purchase was guided largely by the boiler attendants, who naturally favored the fuel that would give the least modicum of trouble in the matter of attendance and clinkering, so the amount of ash was a consideration apart from its effect on the calorific value of the fuel. He has tested some of the coal slacks, most generally used in the district for steam raising, and found that the average results from 5 samples, were 8.5 per cent. of ash; calorific value, as indicated by the calorimeter, 13,160 B. T. U.; water evaporated per pound of fuel, 13.6 lbs.; price at colliery, 9s. 5d. per ton. Five samples of coke, made from local coal as used in the district for the production of gas, gave an average of 9.9 per cent. of ash, 13,060 B. T. U., and 13.5 lbs. water evaporated. For practical purposes not only the comparative tests should be considered, but also the composition of the combustible constituents, in connection with the problem of complete combustion, as instanced by the large volumes of smoke escaping from factory chimneys. Attention was next directed to the percentage of moisture in the fuel, and to the various methods of quenching coke as affecting that point. Coke cooled by sprinklers was practically free from moisture, but that treated in the usual way by hosepipes or buckets might contain anything from 3 to 15 per cent. The address concluded with some practical considerations as to coke handling plant and educative methods.

New Methods and Appliances.

A New Inverted Lamp.—English patents have been issued for this regenerative lamp. This invention relates to high or low pressure inverted incandescent lamps, wherein the secondary air is passed through a heating chamber and heated directly by the products of combustion, and then delivered to the lower surface of the mantle.



The gas and primary air pass through the tube *A*, and thence through a mixing chamber *B* and nozzle to the mantle. Surrounding the mixing device is an air-heating chamber, *E*, which communicates by four or more radial tubes, *F*, with the outer casing of the lamp, so that air may pass through the tubes to the chamber *E*. Leading from the chamber *E* are a number of tubes, *H*, arranged between the tubes *F*, and extending downwards through a ring plate, *I*. Between the globe and mantle is an open-ended and slightly tapered chimney *K*, and the tubes, *H*, discharge into the annular space between the outer globe and the chimney. By this arrangement the space is filled with air at a temperature slightly lower than the temperature of the air between the chimney and the mantle; the difference between the two temperatures being sufficient to cause an upward draught through the chimney. Thus a current of secondary air is drawn through the chamber *E* and down the outside of the chimney *K* to the foot of the mantle, while the hot products of combustion pass round the outside of chamber *E* and tubes *FH*.

Warming Paints.—A paint has recently been put on the European markets under the trade name "Efkalin," devised for the protection of machine parts from overheating. The paint is light red in color, and is applied to the bearing and other parts subject to heating from friction. If heated to 50° C. (120° F.) it turns to brown-red, at 70° C. (158° F.) to a dark-red, and at 85° C. (185 F.) almost black. Its bright color, when cool is so striking that any heating is immediately noticed, giving ample notice in time to avoid damage to the bearing. The important thing is that the paint resumes the original color at once upon cooling, and will last practically indefinitely.

Another paint, called "Acalorin," is intended to protect from heating by the rays of the sun; and when applied to glass, slate or metal roofs, is claimed to keep temperatures under them from 15° to 45° F. lower than under unpainted coverings.

A Self-Cleaning Strainer.—This "C. C. Strainer" is designed for the protection of turbines, engines, pumps, traps, pressure regulators, meters, and other similar apparatus. It consists of 3 parts: body, *B*; closure cap, *C*, and strainer cylinder, *A*, and has a bottom blow-off connection. The fluid handled passes, as indicated by the arrors, into the strainer cylinder at the top, and out through the perforations. The cylinder is a bronze tube with ¼ inch perforators, giving nearly 3 times the area of the pipe connections. It is cleaned by opening the blow-off, the velocity of the passing fluid scouring off the foreign matter lodged on the surface of the strainer.

Items of Interest
FROM VARIOUS LOCALITIES.

Some days ago Mayor Ainslie approved the measure known as the gas fixture ordinance, which measure, in the opinion of Inspector Shelton, and other members of the Richmond (Va.) government, is the most practical, beneficial gas ordinance on the statute books. Its purpose is to bring about a steady improvement in the gas distribution conditions of the city by encouraging gas users to replace lighting fixtures of doubtful efficiency with other goods of modern and useful sort. It is declared that the ordinance is really traceable to the suggestions of Mr. Arthur Graham Glasgow, who, at the invitation last summer of the Administration Board, made a pretty thorough examination of gas conditions in Richmond. In his summing up he put much stress on the fact that the distributing system was in poor way, and recommended that the authorities keep at the task of inducing consumers to instal lighting fixtures of modern type. Our informant then goes on to say: "Upon this recommendation the Administrative Board prepared and introduced an ordinance which would have made it compulsory upon citizens using gas to replace old fixtures with new ones, upon the order of the Inspector of Gas. The compulsory feature of the ordinance aroused strenuous opposition, and it was finally stricken out in committee. As the law stands, it directs gas inspectors to report inadequate fixtures, but gas users are at liberty to replace them with more modern appliances or not, as they choose. The city is bound by the ordinance to see that all service pipes and connections with the street mains are of approved type and adequate for the needs of the user."

Mr. D. I. Gilmour, whose excellent worth as a member of the Board of Gas and Electric Commissioners, Norwich, Conn., is known to every resident in the city, was recently appointed to another term of 3 years by Mayor Murphy. More power to them.

At the annual meeting of the Louisville (Ky.) Gas and Electric Company, the following executive management was perfected: President, Gen. G. H. Harries; Chairman, Board of Directors, H. M. Byllesby; Vice-President and General Manager, D. McDonald; other Vice-Presidents, Jas. P. Brown and M. A. Morrison; Treasurer and Secretary, T. B. Wilson; Assistant Secretary, F. A. Nobbe; Assistant Treasurer, H. List. Mr. R. J. Graf, of Chicago, was elected member of the Executive Committee, vice Chas. E. Doherty, resigned.

The Public Utilities Commission, of Connecticut, and the owners of the Bridgeport (Conn.) Gas Light Company have been (in fact are) at odds over the fact whether or not the Company was paying to its superior officers salaries much larger than the relative importance of the said situation would warrant. The Company refused to itemize the list, but submitted the total amount paid out on such account; whereupon the matter was ordered into the courts. It might be further necessary to here state that the Bridgeport matter in hand was a petition by certain residents that a cut be made in the selling rate, and the petitioners also protested that the salaries paid on certain accounts were altogether disproportionate, which condition would naturally have something to do in respect of rate fixing.

And the above was suggested by this advertisement in the Holyoke (Mass.) *Telegram* of the 24th inst.: "A competitive civil service ex-

amination, for the position of foreman in the Gas and Electric Department of the City of Holyoke, will be held May 11, 1914. The salary is $21 a week. A man is wanted, capable of taking charge of men engaged in making coal and water gas. The examination will consist of a sworn statement of training and experience; arithmetic; expert writing; a handwriting and accounting test; and practical questions on the operation, the apparatus and appliances, the supplies and materials, and the products and bi-products of a gas plant equipped for the manufacture of both coal and water gas. Only male citizens of the United States, who have been residents of Massachusetts for the past year, and of Holyoke the 6 months last past, have a right to apply. Applications may be had by applying to the Civil Service Commission, State House, Boston.

AND the weekly return for all this brawn and brain requirement is $21 per week? Well, the Holyoke folks may get their man, under the above conditions; again, they may not.

"B. S. L.," writing from Nevada, Ia., under date of the 25th inst., says: "Extensive improvements are being made at the plant of the Iowa Public Service Company, which concern supplies the gas used for lighting and heating in the settlements of Nevada and Ames, and for the farmers resident near the line connecting the named places. The plant proper is located in College Park, Ames, and the betterments include an additional 6 ft.-6 generator and suitable additional steam raising apparatus. These additions will practically double the capacity of the plant, and it is believed they can be completed by July 1st.

A QUARTERLY of 1¼ per cent. was declared by the Easton (Pa.) Gas Works from its net earnings for the quarter ended March 1, 1914, payable May 1st, to stockholders of record, according to advices from Messrs. Meikleham and Dinsmore. It may be worth while to note in this connection that the entire stock of the Easton Company is now of the common sort only.

"B. L. M.," writing from Providence, R. I., under date of the 24th inst., incloses this clipping from the Providence *Journal*, of even date: Over 60 employees and guests were present last evening at the annual dinner of the Blackstone Valley Gas and Electric Company, Woonsocket division. Guests were present from Boston, Pawtucket, New London and other outside points. The dinner was presided over by Mr. Joseph Pratt, the President. The Secretary, following the dinner, read a voluminous report respecting the growth of the Club in the 5 years of its existence. Speeches were made by Fred. P. Royce, of Boston, President of the Company, and Vice-President of the Stone and Webster Management Company, A. F. Townsend, Local Manager of the Company, and John J. Heffernan spoke on the exceeding value of the Club to the corporation and to its men, and also made particularly happy reference to the value in this regard of years of service rendered a corporation by its employees. Mr. Royce described the financing of public utility operations, the value of the Club and many years of service with the Company by a number of the employees. Mr. Heffernan spoke on the value of the Club to the members, and closed his address with a positive appeal for every member to support the country and its rulers in the Mexican crisis.

"MR. SPELLMAN seems to have accurate knowledge of the business of the Westerly Light and Power Company, and its subsidiary, the Mystic Power Company, for the calendar year 1913, which, of course, is not to be wondered at, remembering that he was there on the job all the time. The gross earnings were $124,962, a gain of 7.74 over 1912; but net earnings were only $53,924, a shrinkage of 2.61 per cent. The number of gas consumers showed a total of 1,163, or a gain of 17.71 per cent., and the electric consumers showed a total of 1,908, or a gain of 19.28 per cent. over the previons year. The total amount of money spent on new construction and improvements during 1913 was returned at $32,873. The earnings for 1913 showed that interest on the first mortgage had been earned virtually 3 times, while the balance applicable to preferred dividends was 16.13 per cent., leaving a balance of 4½ per cent. for the common stock."

AT a meeting of the Wilmington (Del.) Gas Study Club, held the 21st inst., this ticket was prepared and placed conspicuously in the House—the gentlemen named are those whom it is proposed to have manage the Club's affairs from the seats of the officers: For President, M. J. Conway or W. B. Pritchett; for Vice-Presidents, George Schuler, Frank Curlett or Harry Crooks; for Secretary, A. R. Baldwin; for Treasurer, George H. Lackey; for Trustee, J. Driscoll, J. Fedigan ar Charles McConnell. The election is set for Monday next. During the evening very interesting speeches were made by W. J. McCorkindale and Thomas Newell, on "Main and Service Leaks."

R. W. RAYNER, writing from Westhampton, N. Y., says that the Sag Harbor Lighting Company is to merge with Long Island Gas Corporation, which has just filed articles of incorporation with the Secretary of State. The Directors are H. F. Cook, of Sag Harbor; George E. Fahys, of Locust Valley; and H. Allen Odell, of New York city. The first two named are principal owners of the Sag Harbor gas works. The corporation is capitalized for $100,000, and is to supply Sag Harbor and Southhampton villages with gas for all uses on lighting and heating accounts. Some time ago a fairly large gasholder was erected in Sag Harbor, and gas will be piped 10 miles over to Southampton. The corporation proposes to distribute gas to East Hampton, Bridgehampton and Water Mill.

THE Charleston (So. Car.) Consolidated Railway, Gas and Electric Company has been granted permission to increase its capital stock from $3,000,000 to $3,500,000.

"B. L. B.," writing from Dayton, O., under date of the 25th inst., says that despite losses in gross earnings occasioned by the flood of last Spring, and extensive outlays for improvements and additions on plant account, the annual report of the Dayton (O.) Gas Company showed net earnings amounting to $180,534.50. Prominent business men of Dayton, including several bankers, declare that the Gas Company's showing affords a splendid example of the strength and stability of Dayton concerns, that would have overwhelmed many other communities. President Hanley declares in the report that the Company has no floating indebtedness in the shape of notes or other obligations. The total property valuation certified to for taxation is $1,938,000, and during the year $92,000 was received from the proceeds of bonds issued to meet the emergency caused by the flood. Damages to the artificial and the natural gas plants by the flood totalled $54,701.34, and the loss in gross earnings to $116,728.91. For additions to plant during the year the expenditures amounted to $83,527.06. Consumers of natural gas figure 17,000 as against 10,894 on artificial use. The ordinance limiting the charge for natural gas to 30 cents per 1,000 cubic feet, expires April 30, 1915, while the franchise providing that the price for artificial gas $1 per 1,000, with 15 per cent. off for prompt payment, does not expire until September 1, 1921.

THE Philadelphia *Times*, of the 24th inst., says that the annual report of the United Gas Improvement Company shows that the net profits for the year were $7,471,107, or an equivalent of 13.47 per cent. on its $55,502,950 of capital. Besides the net profit $790,500 was set aside for sinking fund purposes to take care of the investment in the Philadelphia gas works. President Samuel T. Bodine declared that the net earnings for 1913 show a decrease of $53,853, while there is a decrease of $1,875 in the total earnings, which were $8,613,194. The expenses ($1,142,087) show an increase of $51,708 over 1912. It is proposed to expend $1,592,089 on the Philadelphia works this year, and on all other plants the expenditure on ways and-means, including betterments, etc., is put at $4,845,490.

THE Massachusetts Board of Gas and Electric Light Commissioners has approved the joint petition of the town of Framingham, and of the Framingham Board of Trade, that the rate for gas in Framingham, from the first of May, 1914, until further notice shall be $1.40, net, per 1,000 cubic feet.

MR. EUGENE H. BELL, formerly of Youngstown, O., has been appointed Manager of the Youngstown (O.) Consolidated Gas and Electric Company, including the branches at New Castle, Sharon and Ellwood City.

MR. D. ARTHUR BARNES, of Columbus, O., has been elected Secy.-Treas., the Winston Salem Gas Company, of North Carolina. He succeeds Mr. Beverly Sullivan.

THE Keystone Gas and Securities Company, of Coudersport, Pa., has been incorporated. It is capitalized in $75,000.

THE proprietors of the Winona (Minn.) Gas Light and Coke Company have determined to hereafter sell its coke output to the community at first hand, instead of employing the Western Elevator Company. It will be sold under the name and title of "Winona Made Gas Coke."

Utilities Commission News.

CLASSIFICATION OF CONSUMERS.—The right of a company to make arbitrary classification of gas users, to which varying rates are charged, is at stake in cases being fought before the Ohio Utilities Commission. The Mansfield Gas Company had a classification that gave a high rate to a laundry and a low rate to a foundry using about the same quantity of gas. The laundry man protested and appealed, and the Commission ruled that the low rate was for a large quantity, hence, any large user was entitled to it. The gas company has appealed for a rehearing. A similar complaint came in recently from Drake County.

CHARLESTON (W.VA.) PROTESTS.—The Charleston Chamber of Commerce has filed complaints with the Public Service Commission against discrimination by the United Fuel Gas Company. The Company has made lower rates in Huntington, which is 50 miles from the gas field.

WANT NINETY CENT RATE.—Consumers of gas in Metuchen, Perth Amboy, Raritan township, Woodbridge, Sewaren, Rahway, Elizabeth, Linden, Cranford, Springfield and other New Jersey towns, supplied by the Elizabethtown Gas Light Company and its alleged affiliated corporations—the Metuchen Gas Light Company, the Rahway Gas Light Company, the Cranford Gas Light Company and the Perth Amboy Gas Light Company—have asked that a hearing be granted by the State Board of Public Utility Commissioners. The petitioners charge the Elizabethtown Gas Light Company with practicing discrimination and rebating, contrary to law, and they are hoping to have a flat rate of 90 cents established. Elizabeth people, it is said, do not think they should pay any more than residents of Newark.

CHANGES IN MARYLAND LAWS.—Several amendments to the Maryland Public Service Commission laws were passed during the closing hours of the last legislature of that State. One gives the Commission power to regulate quality of gas; another provides that, when a franchise is once exercised, it cannot be abandoned on any pretext; another very important one gives the Commission jurisdiction over all municipal water and lighting companies that do business in competition with other companies, excepting those in Baltimore city. This last was made necessary by the trouble the Commission has had with several municipally owned utilities, and its need of authority over them.

SMALL MAJORITY IN FAVOR OF "HOME RULE" AT CHICAGO ELECTION.—A question of public policy presented to the voters of Chicago at the election of April 7, was the following: "Shall the State Legislature amend the act creating a State public utilities commission, approved June 30, 1913, so as to provide for home rule and control by the city of Chicago of public utilities within the city?" Much to the surprise of the politicians, the magic of the home-rule cry in public-utility regulation, was not so effective as had been contended. The vote was in the affimative, but the majority was so small that the effect on the Legislature will probably not be great. The figures were: "Yes," 176,850; "no," 168,682. Women voted as well as men, but their negative votes were almost in the same proportion as those of the men.

MAY CHARGE ONE DOLLAR MONTHLY MINIMUM.—The New Jersey Public Utility Commission has authorized the Wildwood, Anglesea and Holly Beach Gas Company to establish a monthly minimum charge of $1. The rate for gas is $1.50 per thousand cubic feet, and the Company claimed that $1 was a reasonable minimum, in view of the fact that it had to maintain the year round a plant sufficiently large to take care of the heavy summer business characteristic of tis territory.

CINCINNATI VALUATION.—The city of Cincinnati has asked the Ohio Commission to appraise the properties of the Union Gas and Electric Company; and as obliged by the terms of the law a valuation has been ordered. The work will be done by engineers representing the Company and others appointed by the Commission.

GAS CONSUMERS' DEPOSITS IN NEW YORK.—Preliminary inquiries by the Public Service Commission, for the First District of New York, showed that the gas companies under its jurisdiction held $3,557,173.31 in service deposits made by consumers. These deposits are now the subject of a special investigation under Commissiener Maltbie. The Commission's inquiry is for the purpose of determining whether the companies should be required to pay interest annually on such deposits. While the law demands interest at 6 per cent., the practice has been to make no payment until consumers either stop the service or change their residence.

The Market FOR GAS SECURITIES.

Consolidated almost broke a record last week in that its quotation advancement this morning (Friday) of 130½ to 131, is 1½ in the bid. Yesterday 600 shares were sold on the Exchange, and up to noon to-day the recorded transfers amounted to well over 1,000. Consolidated quarterly of 1½ is payable the 15th prox.

Brooklyn Union, too, managed to get somewhere nearer its true level, the advance being perhaps ½ point. However the sharps on the Exchange say 125 to 126 is about right. It is to write.

The bond market at times was active. We note these sales for the week; $2,000 California Gas and Electric 5's, 93½; Chicago Gas Light and Coke 5's, $2,000 at 103; N. Y. Gas, Electric Light and Power, 5's, $5,000, at 104⅝; $1,000 Ogden Gas (Chicago) at 95; Peoples, refunding 5's, $4.000, at 101.

In the out-of-town market gas shares are somewhat better on the average. U. G. I. is 165 to 166; Peoples, of Chicago, is 120 to 120½.

GAS STOCKS.

Quotations by George W. Close, Broker and Dealer in Gas Stocks.

115 BROADWAY, NEW YORK CITY.

MAY 4.

☞ All communications will receive particular attention.

☞ The following quotations are based on the par value of $100 per share:

N. Y. City Companies.	*Capital.*	*Par.*	*Bid.*	*Asked*
Consolidated Gas Co	$99,816,500	100	130½	131
Central Union Gas Co.—				
1st 5's, due 1927, J. & J.	3,500,000	1,000	101	103
Equitable Gas Light Co.—				
Con. 5's, due 1932, M. & S.	1,000,000	1,000	101	104
Mutual Gas Co.	2,500,000	100	157	157
New Amsterdam Gas Co.—				
1st Con. 5's, due 1948, J. & J.	11,000,000	1,000	99	101
New York & Richmond Gas				
Co. (Staten Island)	1,500,000	100	59	62
1st Mtg. Gold Bds. 5 p. ct.	1,500,000	—	98¼	100¼
New York and East River—				
1st 5's, due 1944, J. & J.	3,500,000	1,000	103	105
Con. 5's, due 1945, J. & J.	1,500,000	—	98	100
Northern Union—				
1st 5's, due 1927, J. & J.	1,250,000	1,000	100	102
Standard	5,000,000	100	102	104
Preferred	5,000,000	100	93	94
1st Mtg. 5's, due 1960, M. & N.	1,500,000	1,000	90	95
The Brooklyn Union	15,000,000	1,000	125½	125
1st Con. 5's, due 1948, M. & N.	15,000,000	—	103	103
Yonkers	299,650	500	180	—
Out-of-Town Companies.				
Am. Cas & Electric	—	100	81	84
Preferred	—	100	48	49
Am. Light & Traction	12,302,400	100	342	347
Preferred	14,438,206	100	105½	107½
Am. Power & Light	5,631,400	100	62	64
Preferred	3,106,800	100	81	83
Am. Public Utilities	2,935,000	100	45	50
Preferred	3,914,000	100	72½	75
Chicago Gas Co. Guaranteed				
Gold Bonds	7,500,000	1,000	104	106¼
Cincinnati Gas and Electric				
Co.	29,500,000	100	67	69
Columbus (O.) Gas Co., 1st				
Mortgage Bonds	1,500,000	1,000	96	98
Columbus Gas Light & Fuel				
Company	1,562,750	100	65¾	66½
Preferred	3,026,500	100	33	35¾
Consolidated Gas Co. of N. J.	1,000,000	100	15	—
Con. Mtg. 5's	976,000	1,000	94	96
Cities Service	15,78 8,700	100	87	90
Preferred	27,388,400	100	73	74
Denver Gas & Electric	7,000,000	100	92	95
Electric Bond & Share	3,500,000	100	—	—
Preferred	3,500,000	100	96¾	100
Federal Light & Traction	4,750,000	100	21	23
Preferred	2,500,000	100	71	73
General Gas & Electric Co.	2,000,000	100	8	8
Preferred	1,300,000	100	55	60
Hudson County Gas Co	10,500,000	100	—	—
Kansas City Gas Light Co.,				
of Missouri	5,000,000	100	—	86
Bonds, 1st 5's	3,522,000	1,000	98½	99
Laclede Gas Co., St. Louis.	10,000,000	100	90	95
Preferred	2,500,000	100	—	—
Bonds	10,000,000	100	102	—
Lafayette Gas Co., Ind.	1,000,000	100	—	60
Bonds	1,000,000	1,000	60	65
Louisville	2,570,000	50	120	130
Lincoln Gas & Electric	2,200,000	100	30	34
Massachusetts Gas Companies, of Boston	25,000,000	100	86	86¾
Preferred	25,000,000	100	93	—
Madison Gas and Electric Co.				
" 1st Mtg. 6's	400,000	1,000	108	
Montreal L.H.&P., Canada	2,000,000	100	220	222
Northern States Power	8,366,700	100	17	18¾
Preferred	5,745,000	100	74¾	76
Pacific Gas & Electric	38,000,000	100	36	38
Preferred	10,000,000	100	80¾	82 x
Peoples Gas Lt. & Coke Co.,				
Chicago	25,000,000	100	120¾	121¾
1st Mortgage Bonds	30,100,000	1,000	103	103½
2d " "	2,500,000	1,000	104	—
Portland Ry. Lt. & Power				
Co.	35,000,000	100	50	51
Standard Gas & Electric	9,343,150	100	8	8¾
Preferred	11,784,950	100	24¾	25¾
United Gas Imp. Co.	55,502,960	50	166	166¾
United Light & Railways	5,237,500	100	73	74
1st Preferred	5,000,000	100	74¾	76
2d "	3,000,000	100	70	72
Washington (D. C.) Gas Co.	2,600,000	20	405	410
Bonds	[illegible]	—	—	100
Wilmington (Del.) Gas Co.	600,000	50	—	—